THE NASAL MITES OF QUEENSLAND BIRDS (ACARI: DERMANYSSIDAE, EREYNETIDAE, AND EPIDERMOPTIDAE)

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(Plates XXX-XXXI)

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Synopsis

Native and introduced birds of 211 genera and 330 species have been examined for nasal mites in Queensland. At a generic level, this represents 64% of the Australian, and 75% of the Queensland fauna. At a specific level, the corresponding figures are 45% and 58%. Of the Queensland fauna, 53% of the genera and 36% of the species were found to be infested. Three families of mites were discovered in this microhabitat: Dermanyssidae (eight genera, 99 species), Ereynetidae (four genera, 19 species), and Epidermoptidae (six genera, six species). Keys are provided to all genera and species known to occur in Australian birds.

The following 12 dermanyssid species have been described as new: *Tinaminyssus megaloprepiae* from *Megaloprepia magnifica* (Columbidae), *T. myristicivorae* and *T. welchi* from *Myristicivora spilorrhoa* (Columbidae), *Ruandanyssus artami* from *Artamus cinereus* and *A. minor* (Artamidae), *Ptilonyssus neochmiae* from *Neochmia phaeton* (Ploceidae), *P. struthideae* from *Struthidea cinerea* (Corvidae), *P. corcoracis* from *Corcorax melanorhamphus* (Corvidae), *P. orthonychus* from *Orthonyx temminckii* (Timaliidae), *P. monarchae* from *Monarcha trivirgata* (Muscicapidae), *P. setosae* from *Rhipidura setosa* and *R. rufifrons* (Muscicapidae), *P. gerygonae* from *Gerygone palpebrosa* (Sylviidae), and *Sternostoma neosittae* from *Neositta striata* (Sittidae).

The following three ereynetid species have been described as new: *Boydaia myzomelae* from *Myzomela sanguinolenta* (Meliphagidae), *B. maluri* from *Malurus amabilis* and *M. melanocephalus* (Sylviidae), and *Ophthalmognathus accipitris* from *Accipiter fasciatus* (Accipitridae).

Fourteen dermanyssid, eight ereynetid, and one epidermoptid species have been recorded from Australia for the first time, as have the genera *Rhinoecius* (Dermanyssidae), *Ophthalmognathus* (Ereynetidae), and *Mycteroptes* (Epidermoptidae). Forty-nine new host-records have been detailed for 24 dermanyssid species, and one each for one ereynetid and one epidermoptid species.

Forty generic and 56 specific names (of which 25 and 36, respectively, are new synonyms) have been discarded as being based on too typological an approach to taxonomy, without due regard to intraspecific variation and zoogeography.

Five habitats have been sampled more or less intensively, *viz.* rain-forest, tropical woodland, tropical tussock grassland, semi-arid savannah, and coastland.

Host-specificity is well marked, each genus or species of mite being restricted to a particular family, genus, or species of bird. This is true both of cosmopolitan and Old World groups of birds that occur in Australia (even if represented by only one species), and of birds such as the honeyeaters (Meliphagidae) that have radiated in, and are restricted to the Australian zoogeographical region.

The rhinonyssine genera (Dermanyssidae) are considered monophyletic and separable only on ecological grounds from the ectoparasitic macronyssine species found on both birds and mammals. In both subfamilies, the protonymph has well developed chelicerae like those of the adult female, while the deutonymph, with poorly developed chelicerae like those of the larva, is a non-feeding stage. The genera have developed along three lines. *Tinaminyssus*, a simple genus retaining extensive dorsal shields and a tritosternum in species parasitizing ground-birds, leads, by reductions of the dorsal armature and the respiratory apparatus, to three genera restricted to birds of the shore and open water (*Larinyssus*, *Rallinyssus*, and *Rhinonyssus*). All four possess normal chelicerae with two unreduced digits. In *Ruandanyssus* and *Rhinoecius*, the fixed digit is absent, leaving a falcate movable digit of normal proportions. In *Ptilonyssus* and *Sternostoma*, both digits are considerably reduced, with a concomitant tapering of the distal half of the cheliceral shaft.

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I. INTRODUCTION

The first nasal mites of birds were described, sporadically, by European workers (Giebel, 1871; Berlese and Trouessart, 1889; Trägårdh, 1904; Hirst, 1921*a, b*, 1923), and this work was reveiwed and extended by Vitzthum (1935). More recently, considerable work in Brazil by de Castro (1948), Pereira and de Castro (1949), and do Amaral (1962 *et seq.*) has been supplemented by studies in the U.S.A. by Furman (1957), Strandtmann (1951 *et seq.*), Hyland (1961), and Clark (1958 *et seq.*). Fain's reviews of the Rhinonyssinae (1957*e*), Speleognathinae (1963*c*), and Turbinoptinae (1960*c*) are based on his numerous papers, particularly on the African and European fauna, but augmented by material from birds of all kinds dying at the Antwerp Zoo. Zumpt and Till (1955) have also studied the African fauna, Bregetova (1964 *et seq.*) has initiated useful studies in the U.S.S.R., and Wilson (1964 *et seq.*) is working up extensive collections from S.E. Asia and New Guinea. Lesser papers by several other workers are mentioned whenever necessary in the text below, and reveiws have been published by Hyland (1963) and Fain (1965*a*). Ticks and chiggers (Acari: Argasidae and Trombiculidae) have each been once recorded from similar microhabitats in birds (Amerson, 1966; Brennan, 1965), but are not considered below. Another oddity is the single specimen of *Halarachne miroungae* Ferris, specific for seals (Pinnipedia : Phocidae), found in the larynx of a gentoo penguin, *Pygoscelis papua* Forster, kept in the same enclosure (Fain and Mortelmans, 1959; Domrow, 1962).

Ptilonyssus trouessarti Hirst (1921*b*) was the only species known from Australia when the present study was commenced five years ago. At first, I published small instalments as material came to hand (Domrow, 1964*a et seq.*), but have, for the past three years, determined to assemble material until the law of diminishing returns had run its course. This last instalment therefore comprises the briefest possible summary of previous records, as well as details of all new material collected. Its text was closed on June 30, 1968. An attempt has also been made to list all mite species, which, while not yet collected, can be expected to occur, together with their hosts, in Australia. A complete host-parasite list is also given, together with an indication of the groups of birds that have not yet been examined (Tables 2 and 3), that future collecting, both in Queensland and elsewhere in Australia, may be directed towards the birds (and habitats) most likely to prove rewarding. Thus, although no swifts (Apodiformes : Apodidae) have been examined, this group is known to harbour three rhinonyssines overseas (Fain, 1957*e*; Sakakibara, 1967).

All holotypes have been deposited in the Australian National Insect Collection, C.S.I.R.O. (Canberra), and paratypes, when available, have been lodged in this Institute, the Prince Leopold Institute of Tropical Medicine (Antwerp : Dr. A. Fain), and the Bernice P. Bishop Museum (Honolulu : Dr. R. W. Strandtmann).

The initials of the collectors, apart from my own, are those of G. J. Barrow, H. Battam, E. H. Derrick, I. D. Fanning, M. L. Friel (*née* Emanuel), B. H. Kay, H. J. Lavery, H. I. McDonald, D. J. Moss, J. Nielsen, H. A. Standfast, J. S. Welch, and R. H. Whitehead.

II. LOCALITIES AND HABITATS

The localities in Queensland mentioned in Section IV below are indicated in Fig. 1a, and have been divided into five major categories, with vegetational notes after the "Atlas of Australian Resources" (Department of National Development : Canberra, 1955). Of the New South Wales localities, the Tweed River flows through an area of subtropical rain-forest, while Urbenville is in sclerophyll, and Mt. Keira (near Wollongong) in wet sclerophyll forest.

(*a*) *Rain-forest.*—Of the northern localities, the tropical rain-forest studied at Maalan and Jordan Ck. (both on the escarpment of the Atherton Tableland near Millaa Millaa) have been discussed more fully by Domrow (1967*b*). The rain-forest at Ella Bay reaches right to the beach, and is relatively undisturbed, but that around Innisfail has been largely destroyed as a result of extensive sugar-cane farming. The Mt. Jukes locality has also been detailed by Domrow (1967*b*).

Webb (1959) has pointed out a difference in the rain-forest environment to the south of Sarina, and the three submontane areas studied in S. E. Queensland are therefore better classified as subtropical rain-forest. These are Mt. Glorious, Upper Brookfield, and Wilson's Peak (Plate xxx, Fig. 1).

(*b*) *Tropical woodland.*—Apart from Chillagoe and Charters Towers, in relatively drier areas of north Queensland, the remaining localities in this category are in the far south-east of the state (Esk, Cobble Ck., Mt. Nebo, Samford, Brisbane, Mt. Cotton, Logan Village, Tamborine Village, Oxenford, and Palen Ck.). These are all in open eucalypt forest, but, in certain valleys with higher precipitation and denser vegetation, birds typical of rain-forest, *e.g. Macropygia phasianella* (Temminck) and *Chibia bracteata* (Gould), are commonly seen. The Esk area (Plate xxx, Fig. 2) will be treated in more detail elsewhere (Domrow, 1969).

(*c*) *Tropical tussock grassland.*—This category, mixed with tropical woodland, is typified by Kowanyama (fomerly the Mitchell River Mission), and has been treated in detail by Doherty *et al.* (1963), Standfast (1965), and Domrow (1967). Viruses isolated from wild birds at this locality have been detailed by Whitehead *et al.* (1968). Longreach Lagoon lies between Gamboola and Highbury cattle stations.

(*d*) *Semi-arid savannah.*—Condamine is in an area of tropical woodland mixed with layered scrub, while Mitchell, Charleville, and Augathella are in an extensive area of tropical woodland mixed with arid scrub. To the south, Cunnamulla is surrounded by semi-arid, low-tree savannah, and, further inland, Winbin Ck. lies in mixed semi-arid shrub savannah and arid scrub. Finally, Windorah, in semi-arid tussock grassland, sees the beginning of the red dunes of the inland desert (Plate xxxi, Fig. 1).

(*e*) *Coastland.*—The estuary of Topsy Ck. and Half Tide are open ocean beaches with large areas of sand. Tin Can Bay is a sheltered, very shallow inlet with a narrow sandy beach above extensive mudflats, the latter being exposed only at low tide (Plate xxxi, Fig. 2). Cowley Beach and Chelona are examples of mixed coastal woodland, characterized by low forest on impoverished soil, with extensive areas of mangroves along the water margins.

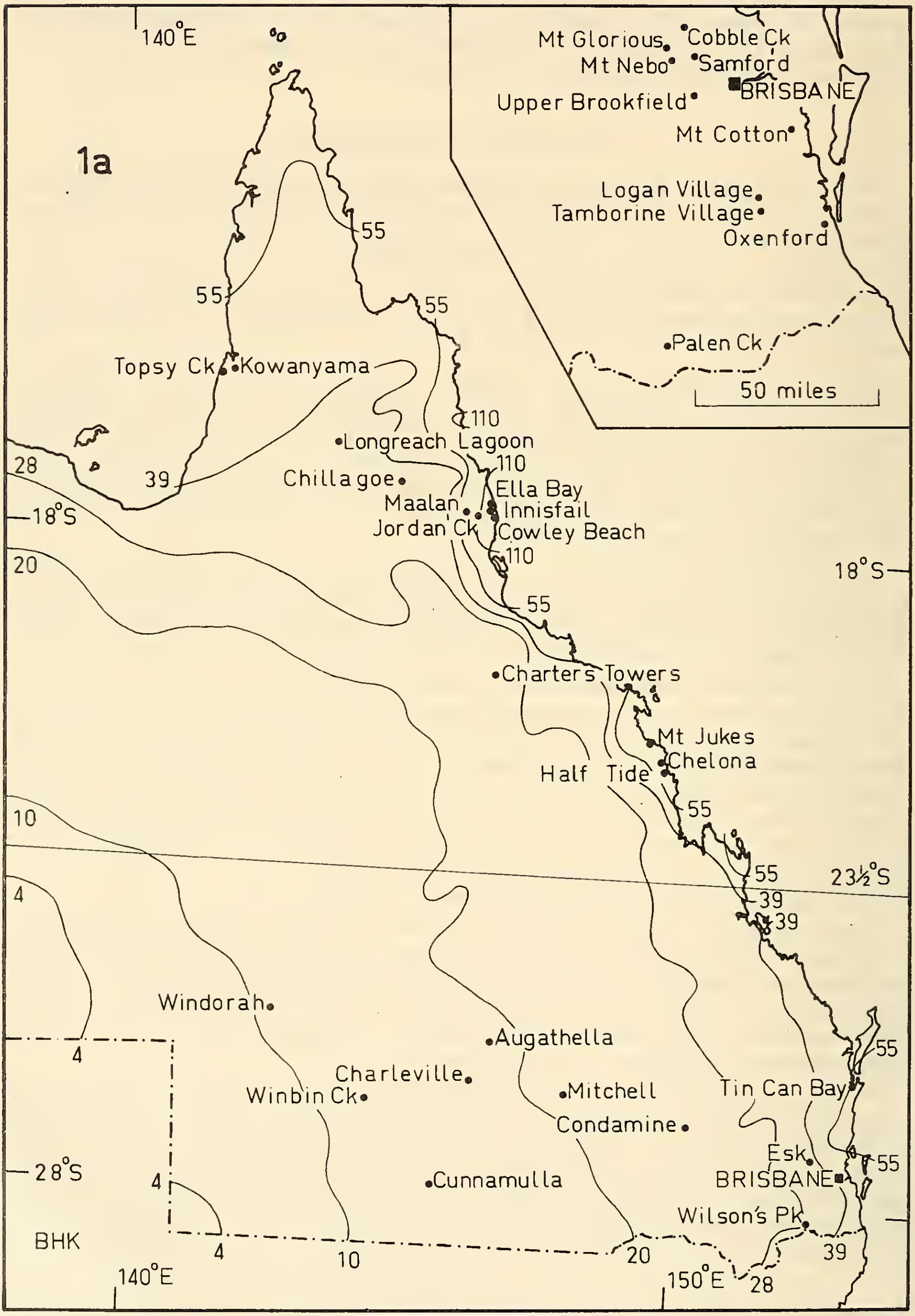

Fig. 1a. Map of Queensland showing localities mentioned in text (isohyets in inches/year).

III. METHODS AND MATERIALS

The classical method of collection of intranasal mites is that of Fain (1957*e*), and I can do no better than repeat his essentials: *"La récolte des Acariens a été pratiquée généralement peu de temps après la mort de l'Oiseau . . . le bec est largement ouvert. Au moyen d'une paire de ciseaux à mors fins on découpe le palais, le plus près possible du bec et sur une grande longueur de façon à bien exposer la région qui correspond aux narines. Les tissus excisés sont . . . examinés ultérieurement . . . Pour examiner les narines par l'intérieur il est souvent nécessaire de disséquer les cornets situés profondément ou les lamelles cornées qui cachent plus ou moins leur orifice interne.*

"Les Epidermoptidés sont généralement cantonnés à l'intérieur même des narines et ce n'est qu'en cas de forte infestation qu'on peut les voir envahir la profondeur des fosses nasales. A cause de leur petite taille ils sont souvent difficiles à découvrir et il est nécessaire d'utiliser un grossissement déjà assez puissant . . . Les Rhinonyssidés vivent également dans les narines, on peut cependant les rencontrer aussi dans le mucus qui recouvre les cornets, mais ils ne s'aventurent jamais très loin à l'intérieur des fosses nasales. Les Epidermoptidés comme les Rhinonyssidés sont animés de mouvements lents et ne se déplacent probablement que très peu. Il n'en est pas de même des Speleognathes qui sont très rapides et circulent dans toute l'étendue des fosses nasales, envahissant même les cellules osseuses".

I would only add that I have supplemented this palatal approach with a dissection inwards and backwards from the nostrils sufficiently deep to expose the air-sacs of the skull, thus facilitating the collection of speleognathines. Even this, if neatly performed, does not preclude the preparation of the skins for museum purposes, and, in any case, the viscera of many of the specimens were taken for virological and parasitological studies. Both Fain (1965*a*) and I (1967*a*) have commented on the fact that nasal mites are not found, except for *Sternostoma tracheacolum* Lawrence and occasional stragglers, in the internal respiratory tract. The work of Maa and Kuo (1965) would confirm this.

The above method allows the collection of virtually every mite present in the nasal passages of each bird, and therefore provides a basis for quantitative population studies. One such study (Domrow, 1967*a*) showed no significant difference in rhinonyssine populations during the wet (March-April) and dry (October-November) seasons at Kowanyama. However, in the present study, only one other locality (Esk) was visited regularly, and work here was directed rather towards a thorough sampling of the bird fauna. Consequently, once a species was found and confirmed to harbour nasal mites, it was not collected intensively or ignored at later visits. Further quantitative data on populations have been supplied by ter Bush (1963) and Amerson (1967).

The material was fixed in cold 70% ethyl alcohol containing 5% glycerine, and cleared within a month in warm lactic acid, the latter procedure causing the legs to extend conveniently (excessive heating causes cuticular exfoliation, but this is often of little consequence as the setal bases stand firm). The specimens were then mounted singly (or in pairs if belonging to a common species) in Hoyer's formula for gum-chloral medium (distilled water 50 cc., gum arabic 30 g., chloral hydrate 200 g., glycerine 20 cc., mixed in that sequence at room temperature), and the slides dried in an oven at 37°C. Hoyer's, a water-soluble medium, has many advantages over polyvinyl alcohol, which becomes virtually insoluble and contracts to an extreme degree with age. I have used Hoyer's routinely since 1959, and in the warm-temperate climate of Brisbane, even with its rather humid summers, no crystallization or blackening has taken place, and ringing the coverslip with varnish is not necessary. I fancy the presence of a little lactic acid renders the preparation less prone to dry out at the edge (see also Womersley, 1943).

IV. SYSTEMATICS

In this section, the material collected will be dealt with in systematic sequence, as detailed in Table 1. The following three sections will deal with host-specificity and zoogeography, the phylogeny of the rhinonyssine genera, and host-parasite relationships.

I have accepted Evans and Till's terminology (1965) for the dorsal shields of the idiosoma, except that I have preferred "mesonotal shieldlets" to "mesonotal scutellae" (these authors themselves use the term "shield" for the larger sclerotizations). Also, in the case of the peritrematalia (a term dating at least from Vitzthum, 1935), I have called the accompanying sclerotization, which invariably lies behind the stigma (and peritreme, which is reduced if present at all), the poststigmatic, and not the peritrematal shield.

TABLE 1

Systematic synopsis of the mites collected

Family	Genera Represented	No. of Species	Family	Genera Represented	No. of Species
Dermanyssidae	*Tinaminyssus*	18	Ereynetidae	*Boydaia*	8
(Rhinonyssinae)	*Larinyssus*	2	(Speleognathinae)	*Neoboydaia*	5
	Rallinyssus	4		*Ophthalmognathus*	3
	Rhinonyssus	6		*Speleognathopsis*	3
	Ruandanyssus	2	Epidermoptidae	*Turbinoptes*	1
	Rhinoecius	2	(Turbinoptinae)	*Passerrhinoptes*	1
	Ptilonyssus	53		*Oxleya*	1
	Sternostoma	12		*Schoutedenocoptes*	1
				Rhinoptes	1
				Mycteroptes	1

No rigid nomenclature has been adopted for the dorsal setation, as the frequent reduction renders it difficult always to identify the setae according to Lindquist and Evans' system (1965). Nevertheless, it is recognized that many of the setae present in the Rhinonyssinae have their counterparts in this system. Thus, on the podonotal shield, my verticals are surely their j_1, and my anterolaterals the intermediate members of their j and z series, while the commonly seen posterodiscal arch of four setae would be their pairs j_5 and z_5. The midposterior pair, which, in *Ptilonyssus* Berlese and Trouessart, may or may not be left free in the cuticle depending on the degree of truncation of the shield, is j_6. The five pairs of setae between the posterolateral angles of the shield and the stigmata are r_3, r_{5-6}, and s_{5-6} (s_5 being on or off the shield depending on the degree of its reduction, and absent in some species of *Sternostoma* Berlese and Trouessart). The central eight members of the transverse band of ten setae immediately behind the mesonotal shieldlets in *Ptilonyssus* are the pairs J_{1-2} and Z_{1-2}. Finally, the pygidial setae would be J_5 or Z_5. That these setae of the adult are most easily recognized from Evans and Till's figure (1965) of the dorsum of the protonymph of *Macronyssus flavus* (Kolenati), a macronyssine ectoparasite of bats, is an indication of the reduction common in this endoparasitic group.

The terminology used for the structures on the venter is also that of Evans and Till (1965), except that I have preferred the widely used (and purely Latin) term "adanal" to the hybrid "paranal" for the two setae flanking the anus. The term "cribrum" for the patch of aciculations behind the postanal seta also dates at least from Vitzthum (1935). I have not definitely assigned the setae on the ventral cuticle, but, again, the common occurrence of two setae immediately behind the genital shield, followed by a transverse row of about six, mirrors more closely the nymphal than the adult macronyssine pattern.

The legs have been described according to Evans (1963*a*), in which the tarsal setae designated ad_1 and pd_1, reduced and often difficult to see in the rhinonyssines, are equivalent to the two setae noted, but not included in the tarsal formulae by Domrow (1966*b*).

Finally, Evans (1963*b*) and Evans and Till (1965) have been followed for the terminology of the capitulum, a term they discard in favour of "gnathosoma", although, for its basal portion, they use "basis capituli". I have also preferred to consider the appendage of the palpal tarsus a claw rather than an apotele (Camin *et al.*, 1958), and have followed Sellnick (1965, 1967) in preferring "epistome" to "tectum". The palpal setal formulae commence with the trochanteral setae, and continue, if possible, to the tibiae; they include the two dorsodistal sensory rods on the tibiae.

Additional morphological studies have been made on the chelicerae, the genital aperture, the spermatheca and its ducts, and the coxal and femoral glands (Fain, 1960*e*, 1963*b, f*, 1966*a*).

The foregoing paragraphs refer essentially to the Rhinonyssinae, but Fain (1962*b*, 1963*g, h*) has also discussed sexual dimorphism, the invaginated sensory organ of tibia I, and the solenidia of the Speleognathinae.

Family DERMANYSSIDAE

Subfamily RHINONYSSINAE

This is the classification of Evans and Till (1966), the first serious attempt in two decades to elucidate the suprageneric taxa of the "dermanyssoid" and "laelapoid" complexes.

The initial dichotomies of the following key (those based on the nature of the chelicerae of the adult female, and leading to couplets 3, 6, and 7) follow the first of Fain's classifications (1957*a*), in which the Rhinonyssidae, treated as a full family, were divided into three subfamilies : Rhinonyssinae Trouessart, Rhinoeciinae Fain, and Ptilonyssinae de Castro. The subfamily Agapornyssinae Gretillat *et al.* (1959), based on a synonym of *Sternostoma* (*v. infra*), is a synonym of the Ptilonyssinae. Fain was later (1960*d*) to erect a fifth subfamily, Larinyssinae, monotypic for *Larinyssus* Strandtmann, which, however, I prefer to leave among his rhinonyssine genera.

Further, in more recent work, at least ten new genus-group taxa have been raised (Brooks and Strandtmann, 1960; Fain, 1964*d*; Fain and Aitken, 1967; Bregetova, 1965*a, b*, 1967). Some of these, with composite generic names, cut across Fain's lines of division. For example, *Rhinosterna* Fain and *Sternoecius* Fain and Aitken each show characters of *Sternostoma* (Ptilonyssinae), and of *Rhinonyssus* Trouessart (Rhinonyssinae) on the one hand and of *Rhinoecius* Cooreman (Rhinoeciinae) on the other. Both are placed as synonyms of *Sternostoma* below.

Also, it is clear that other of these taxa are synonyms, even though certain faunas, *e.g.* the neotropical and oriental, require further study. For example, *Trochilonyssus* Fain and Aitken shows the process on coxae II and the elongate sternal and genital shields characteristic of many species of *Ptilonyssus,* and, apart from the chelicerae and the armature of the stigmata, keys directly to that genus in Fain's system of 1960*d*. *P. maluri* Domrow also shows abnormally long cheliceral digits, and the lack of peritremes is a criterion, which, in the case of *Ptilonyssus* and *Passeronyssus* Fain, is shown below no longer to hold.

Bregetova (1964) favours a diphyletic system, recognizing an older group (Rhinonyssidae) and a younger, for which she proposes the new family Neonyssidae.* In one case, the chelicerae of both nymphal stages are said to be similar to those of the adult. In the other, there is alleged a "marked difference between the chelicerae of the feeding protonymph and the non-feeding deutonymph, the chelicerae of the latter reverting to the form in the non-feeding larva". (I use Evans and Till's words of 1965, but should note they were phrased for a different context.)

However, this system also cuts across Fain's, placing *Rhinoecius* and *Sternostoma* among the rhinonyssids, and *Ruandanyssus* Fain among the neonyssids, and I believe it to be based on incorrect observation. I have examined both protonymphs and deutonymphs of *Tinaminyssus* Strandtmann and Wharton (many species from pigeons, parrots, kingfishers, and herons), *Larinyssus, Rhinonyssus, Ruandanyssus,* and *Ptilonyssus,* one protonymph of *Rhinoecius,* and two deutonymphs of *Sternostoma* (I have no immature specimens of *Rallinyssus* Strandtmann), and, in all cases, they confirm Evans and Till's findings, even in such genera as *Rhinoecius* and *Ruandanyssus,* in which the chelicerae lack the fixed digit. Mitchell (1963) has also shown the phenomenon of alternate feeding stages in his detailed morphological study of *Rhinonyssus rhinolethrum* Trouessart, while the pioneer work on this point was that of Strandtmann (1961).

I therefore consider the Rhinonyssinae a monophyletic group of macronyssine origin (see Section VI below), and recognize no intermediate grade between subfamily and genus.

Key to Australian genera of RHINONYSSINAE *(females)**

* This and the following keys are all based on Australian material only.

1. Cheliceral shafts of uniform diameter, the digits occupying more than one-eighth of the total length 2
Chelicerae attenuate in distal half, the digits normally occupying less than one sixteenth of the total length (but one-eighth in *Ptilonyssus maluri* Domrow) 7
2 (1). Both cheliceral digits present 3
Fixed cheliceral digit absent 6
3 (2). Stigmata with peritremes 4
Stigmata without peritremes .... *Rhinonyssus* Trouessart
4 (3). Peritrematalia in normal position above coxae III-IV. Anus normal 5
Peritrematalia situated near caudal extremity of idiosoma. Some species with delicate circumanal frill .... *Rallinyssus* Strandtmann
5 (4). Podonotal shield always entire. Opisthonotal shield entire, fragmentary, or absent .... *Tinaminyssus* Strandtmann and Wharton
All dorsal shields fragmentary .... *Larinyssus* Strandtmann
6 (2). Opisthonotal shield and tritosternum present .... *Ruandanyssus* Fain
Opisthonotal shield and tritosternum absent .... *Rhinoecius* Cooreman

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* Unfortunately, this author, apparently from a lack of literature, uses some genera in an outmoded sense. In particular, *Neonyssus* Hirst has been shown by Fain and Hyland (1962*b*) to be a synonym of *Ptilonyssus*, and her Neonyssidae therefore falls to de Castro's Ptilonyssinae (1948).

7 (1). Stigmata normally with peritremes, but, if not, gnathosoma terminal (except in *P. neochmiae*, n. sp.) and anal shield ventral, normally formed, and bearing postanal seta .... *Ptilonyssus* Berlese and Trouessart
Stigmata without peritremes. Gnathosoma withdrawn ventrally between coxae I at least to level of trochantero-femoral articulation of palpi. Anal shield terminal, usually regressed, and always lacking postanal seta .... *Sternostoma* Berlese and Trouessart

Genus TINAMINYSSUS Strandtmann and Wharton

Tinaminyssus Strandtmann and Wharton, 1958, *Contr. Inst. Acar. Univ. Md*, 4: 161. Type-species *Neonyssus* (*Ptilonyssoides*) *trappi* Pereira and de Castro, 1949, *Archos Inst. biol., S Paulo*, 19: 229; do Amaral, 1967, *Ibid.*, 34: 137. *Mesonyssus* Fain, 1960, *Revue Zool. Bot. afr.*, 61: 313, 62: 102. Type-species *Neonyssus treronis* Fain, 1956, *Ibid.*, 53: 394. New synonymy. *Mesonyssoides* Fain and Nadchatram, 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 271. Type-species *Mesonyssoides malayi* Fain and Nadchatram, 1962, *Loc. cit.*, 272. New synonymy. *Mesonyssoides* Strandtmann and Clifford, 1962, *J. Parasit.*, 48: 723. Type-species *Mesonyssoides ixoreus* Strandtmann and Clifford, 1962, *Loc. cit.*, 723. New synonymy. *Psittanyssus* Fain, 1963, *Revue Zool. Bot. afr.*, 68: 69. Type-species *Psittanyssus baforti* Fain, 1963, *Loc. cit.*, 70. New synonymy. *Falconyssus* Fain, 1966, *Revue Zool. Bot. afr.*, 74: 85. Type-species *Falconyssus elani* Fain, 1966, *Loc. cit.*, 86. New synonymy.

Both Fain (1963*e*) and do Amaral (1967) consider the two species originally placed in *Tinaminyssus* belong to *Mesonyssus*, thereby contravening Art. 23, since the former has priority.

I do not believe the mere absence of the opisthonotal shield in *Falconyssus* justifies its separation from a genus in which this character is notoriously variable (see couplets 2 and 3 in the following key, which include the three species known from Australian psittacids). In any case, this shield is present in *T. milvi* (Fain, 1962*c*), n. comb., and *T. epileus* (Wilson, 1964), n. comb., both of which also have falconiform hosts, and Fain himself has commented (1963*e*) : *"à notre avis le nombre des écussons dorsaux ne devrait pas être utilisé commé caractère générique dans la famille Rhinonyssidae".*

Key to females of Australian species of TINAMINYSSUS

1. Tritosternum present 2
Tritosternum absent 4
2 (1). Opisthonotal shield entire .... *kakatuae* (Domrow), n. comb.
Opisthonotal shield not entire 3
3 (2). Anterior fragment of opisthonotal shield entire, bearing several long, sinuous setae Postanal seta absent .... *aprosmicti* (Domrow), n. comb.
Anterior fragment of opisthonotal shield divided, bearing several short, stiff setae. Postanal seta present .... *trichoglossi* (Domrow), n. comb.
4 (1) Opisthonotal shield present 5
Opisthonotal shield absent 17
5 (4). Adanal setae behind anus 6
Adanal setae in front of anus or at least level with its centre 7
6 (5). Opisthonotal shield subrectangular, with margins distinct. Femur I (1-4/2-1), II (1–4/1–1), III (1–3/1–1), IV (1–3/1–0). Genua I–III (1–4/2–1), IV (1–4/1–0). Capitular setae absent ...... *belopolskii* (Bregetova), n. comb.
Opisthonotal shield subpentagonal, with eroded margins. Femora 8.7.4.4. Genua 8.6.6.4. Capitular setae present ....*epileus* (Wilson), n. comb.
7 (5). No setae inflated basally 8
Some setae, particularly on coxae, strongly inflated basally 15
8 (7). Postanal seta present 9
Postanal seta normaly absent, but minute in specimens of *T. geopeliae* (Fain) from *Geopelia cuneata* (Latham) 11

9 (8). Postanal seta at least as long as adanals .... *melloi* (de Castro), n. comb.
Postanal seta less than half as long as adanals 10

10 (9). Adanal setae at least as long as anus. Venter of opisthosoma with about 10 pairs of rather short setae. Basitarsi II–IV 3.3.3 .... *ocyphabus* (Domrow), n. comb.
Adanal setae barely half as long as anus. Venter of opisthosoma with about 20 pairs of quite long setae. Basitarsi II-IV 4.4.4 *hirtus* (Wilson), n. comb.

11 (8). Adanal setae at least as long as anus 12
Adanal setae considerably shorter than anus ....*columbae* (Crossley), n. comb.

12 (11). Cribrum absent. Basitarsi II-IV at least 4.4.3. Capitular setae absent 13
Cribrum present. Basitarsi II-IV 3.3.3. Capitular setae present 14

13 (12). First pair of setae between genital and anal shields minute. All coxae unarmed. Basitarsi II-IV 4.4.4. All claws subequal ...... *ptilinopi* (Wilson), n. comb.
All setae between genital and anal shields subequal. Coxae II-III armed with crescentic bosses. Basitarsi II-IV 4.4.3. Claws I considerably stronger than II–IV...*myristicivorae*, n. sp.

14 (12). All setae between genital and anal shields subequal. Coxae without rounded bosses .... *megaloprepiae*, n. sp.
First pair of setae between genital and anal shields considerably weaker than remainder. Coxae II-IV with distinct, rounded bosses ....*geopeliae* (Fain), n. comb.

15 (7). Adanal setae shorter than anus. Only one seta on coxa I inflated basally. Basitarsi II-IV 4.4.4 .... *phabus* (Domrow), n. comb.
Adanal setae at least as long as anus. Both setae on coxa I inflated basally. Basitarsi II-IV 4.4.3 16

16 (15). Opisthonotal shield rectangular, confined entirely to dorsum. Setae on ventral surface of opisthosoma simple, including first minute pair. Coxae each with crescentic boss. All claws subequal. Capitular setae present ....*macropygiae* (Wilson), n. com.b
Opisthonotal shield subcircular, encroaching onto venter. Most setae between genital and anal shields inflated basally. Coxae II-IV each with stout spur. Claws I stronger than II-IV. Capitular setae absent *welchi*, n. sp.

17 (4). Four setae in centre of dorsal surface of opisthosoma much larger than remainder. SI-II set on sternal shield. Postanal seta present...*halcyonus* (Domrow), n. comb.
All setae on dorsal surface of opisthosoma subequal. Only SI set on sternal shield. Postanal seta absent .... *daceloae* (Domrow), n. comb.

TINAMINYSSUS KAKATUAE (Domrow), n. comb.

Mesonyssoides kakatuae Domrow, 1964, *J. ent. Soc. Qd,* 3: 35. *Mesonyssus kakatuae,* Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 191; Wilson, 1966, *Pacif. Insects,* 8: 759.

Previous records (both Psittacidae, Psittaciformes).—Red-tailed black cockatoo, *Calyptorhynchus banksii* (Latham), Kowanyama. Rose-breasted cockatoo, *Kakatoe roseicapilla* (Vieillot), Condamine.

New host record.—Cockatiel, *Leptolophus hollandicus* (Kerr) (Psittacidae), Condamine, 12.i.1966, R. D., D. J. M., and J. S. W. (6 ♀♀, 2 ♂♂).

TINAMINYSSUS APROSMICTI (Domrow), n. comb.

(Figs 1-6, 8-15)

Mesonyssoides aprosmicti Domrow, 1964, *J. ent. Soc. Qd,* 3: 26. *Mesonyssus aprosmicti,* Wilson, 1968, *J. Parasit.,* 54: 395. *Mesonyssoides platycerci* Domrow, 1964, *J. ent. Soc. Qd,* 3: 27. New synonymy.

Previous records (both Psittacidae, Psittaciformes).—Red-winged parrot, *Aprosmictus erythropterus* (Gmelin), Condamine. Also Kowanyama. Pale-headed rosella, *Platycercus adscitus* (Latham), Condamine. Also Esk, Charleville, and Longreach Lagoon.

New host records (all Psittacidae).—King-parrot, *A. scapularis* (Lichtenstein), Oxenford, 1.vii.1967, B. H. K. (9 ♀♀, 3 ♂♂, 1 deutonymph). Ring-neck parrot, *Barnardius barnardi* (Vigors and Horsfield), Charleville, 19.i and 1.ii.1967, R. D. and J. S. W. (14 ♀♀, 2 ♂♂); Winbin Creek, 20.i.1966, R. D., D. J. M., and J. S. W. (1 ♀). Mulga parrot, *Psephotus varius* Clark, Charleville, 23.i.1967, R. D. and J.S.W. (3 ♀♀, 2 ♂♂, 1 protonymph). Red-backed parrot, *P. haematonotus* (Gould), Orchard Hills, N.S.W., 22.xii. 1968, D. Himsley (1 ♀). (This specimen was obtained while I was reading proof, and is taken into account only here and in Table 4. It is typical of *T. platycerci* as originally described.)

The original material of the two taxa here combined was separable according to the following couplet:

1. Anterior fragment of posterior dorsal shield with cluster of 10 enormous setae. Sternal plate poorly defined. Metasternal setae present. From an Australian parrot (*Aprosmictus* Gould) .... *aprosmicti* Domrow
   Anterior fragment of posterior dorsal shield with cluster of 12 enormous setae. Sternal plate well defined. Metasternal setae absent. From an Australian parrot (*Platycercus* Vigors) .... *platycerci* Domrow

The central cluster of enlarged mesonotal setae in 17 female paratypes from *A. erythropterus* numbers 9 twice, 10 twelve times, and 11 three times, while 19 additional females from this host at Kowanyama show 8 once, 9 nine times, and 10 nine times. The cluster is not flanked laterally by an additional pair of strong setae as described for *T. platycerci.*

The central cluster is larger in 9 females from *A. scapularis* (Fig. 1), comprising 12 setae three times, 13 twice, 14 twice, and 15 twice (2 of the cluster of 14 in one specimen are not enlarged). Further, these specimens do show this central cluster flanked exteriorly by a further pair of enlarged setae, arranged 1.0 once, 1.1 four times, 1.2 three times, and 0.2 once.

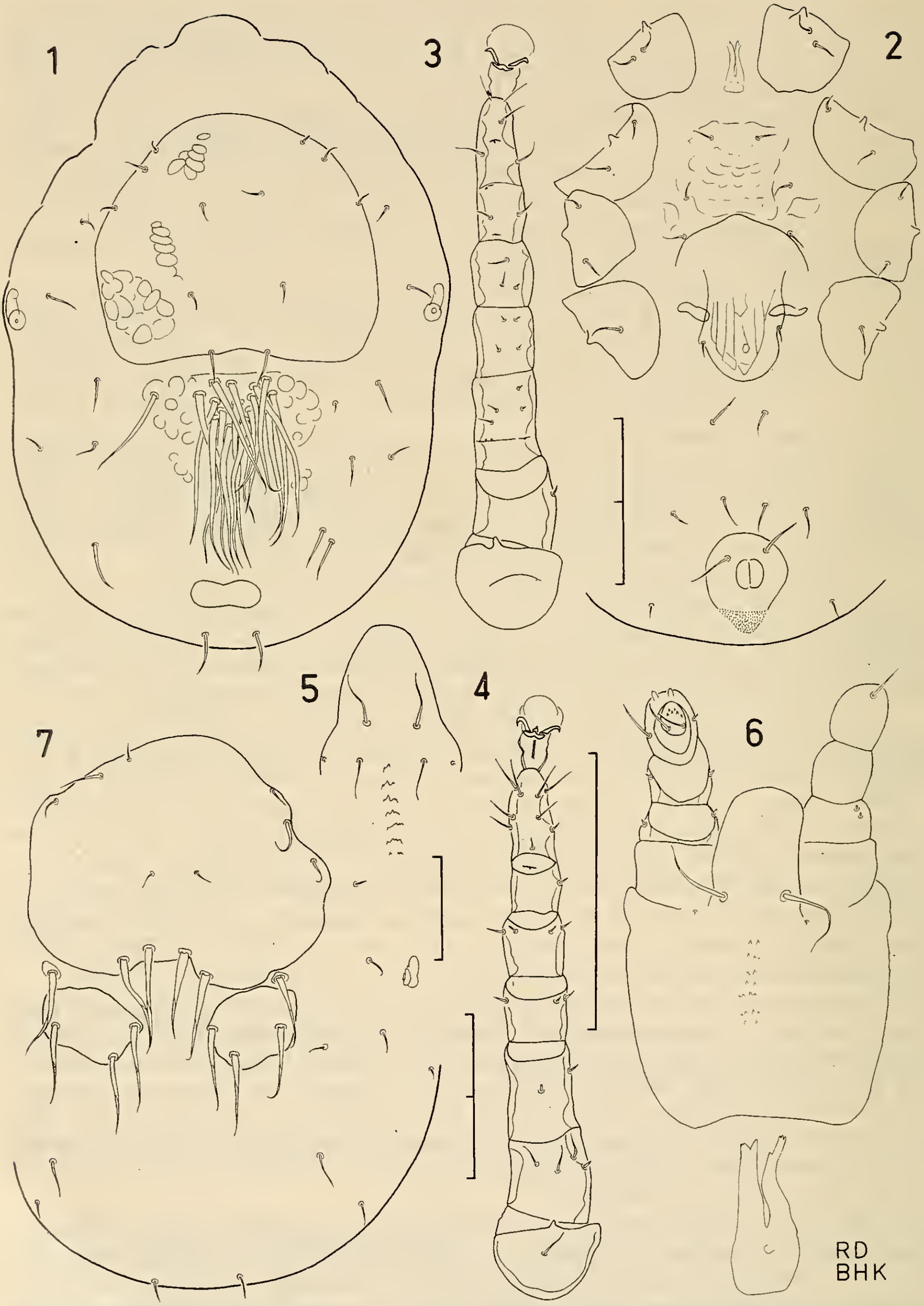
In 43 ♀♀ and 6 ♂♂ from *P. adscitus,* the entire complex of enlarged mesonotal setae numbers 12 in 37 ♀♀ and 2 ♂♂. Five ♀♀ and 3 ♂♂ show 11 setae, lacking one of the exteriormost pair or one of the central cluster. One ♂ and 1 ♀ show 10 setae, the male lacking two setae from the central cluster, and the female one of the exteriormost pair and one from the central cluster. In one female, two setae of the central cluster are completely fused basally, and set in a single correspondingly larger alveolus.

All specimens from *B. barnardi* lack the outermost pair of the complex, the number of setae in the central cluster being 10 five times, 9 ten times (including both males), and 8 once.

The sternal shield is weakly sclerotized and ill-defined in specimens from both species of *Aprosmictus,* but dense and sharply delineated in material from *Platycercus* and *Barnardius* Bonaparte. Metasternal setae are present in all the specimens from *A. erythropterus,* although one paratype and four of the later specimens show a metasternal seta on one side only. The specimens from *A. scapularis* (Fig. 2) are uniformly 3.3 (except 3.2 once), as are those from *Platycercus* and *Barnardius* (in both of which latter, SI is borne on the sternal shield).

The two other species of *Tinaminyssus* recorded from Australian psittacids by Domrow (1964*a*) are *T. trichoglossi* from various lorikeets, and *T. kakatuae* from crested psittacids (cockatoos and the cockatiel). Considerable clinal variation is allowed below in the former species, and the material now discussed from members of a third psittacid group, the parrots, is similarly considered conspecific.

The material from the mulga parrot (*Psephotus* Gould) typically shows only eight enlarged dorsal setae in the mesonotal cluster, and has a sternal shield intermediate between those of *T. aprosmicti* and *T. platycerci* as

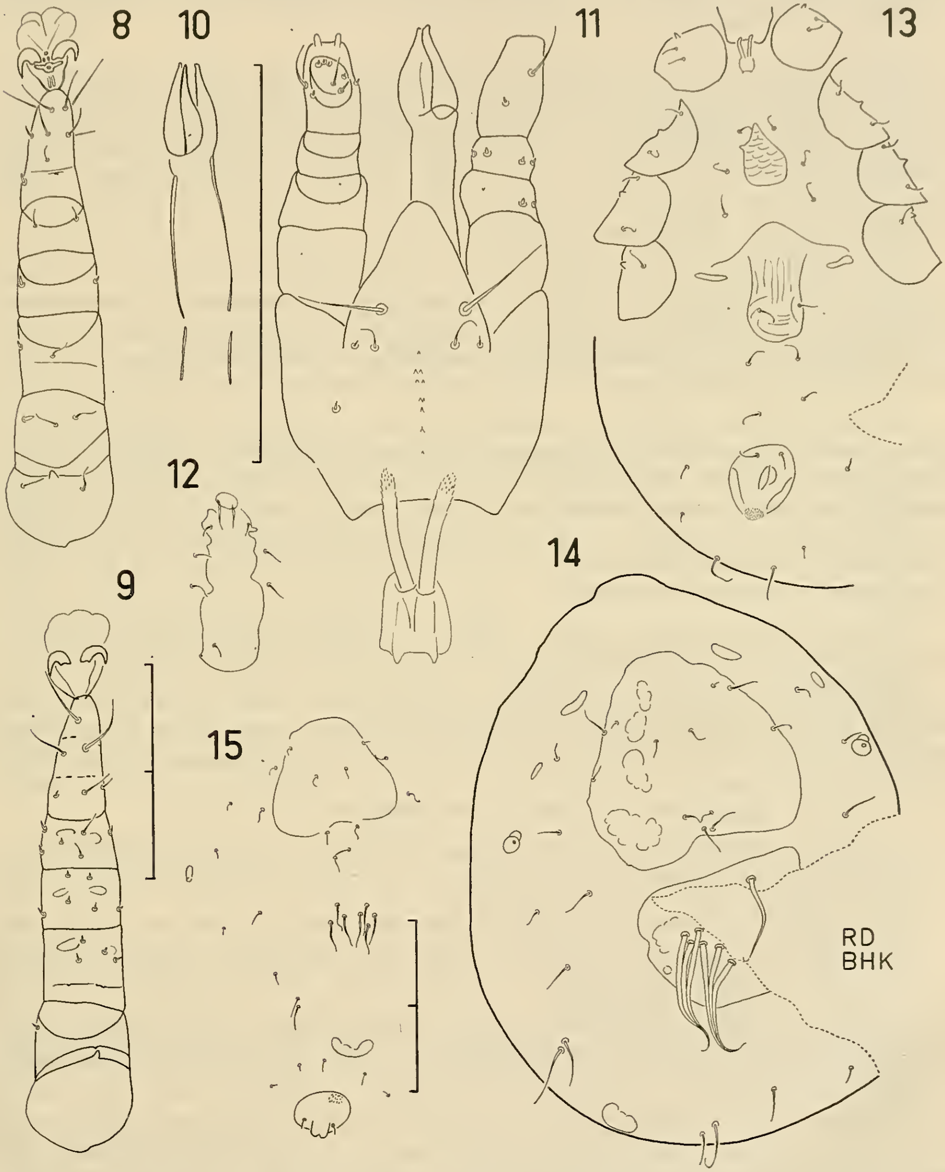


Figs 1–6. *Tinaminyssus aprosmicti* (Domrow) (♀ from *Aprosmictus scapularis*).–1–2, Dorsal and ventral views of idiosoma. 3–4, Dorsal and ventral views of leg IV. 5, Deutosternum and hypostome, with typical setation. 6, Ventral view of capitulum, with atypical hypostomal setation, *i.e.* with HI absent (left palp in dorsal view). (Each division on the scales equals 100μ.)

Fig. 7. *Tinaminyssus trichoglossi* (Domrow) (♀ from *Glossopsitta pusilla*).–Dorsal view of idiosoma.

originally described, being tapered anteriorly, leaving SI free in the adjacent cuticle. Further, there is a concentration of the four midposterior setae on the podonotal shield not shown in the other material, so best the material be described, but within my broadened concept of *T. aprosmicti*.

Female.—A rounded species when engorged, idiosoma 625μ long (calculated from ruptured specimen illustrated). Podonotal shield (Fig. 14) as long as wide, $231\text{-}264\mu$ long, $235\text{-}259\mu$ wide, well defined, subtriangular, but with rounded corners and irregular posterior margin; surface closely



Figs 8–15. *Tinaminyssus aprosmicti* (Domrow) (from *Psephotus varius*).– 8–9, Ventral and dorsal views of leg III of ♀. 10, Chelicera of ♂. 11, Ventral view of capitulum of ♀ (left palp in dorsal view). 12, Sternogenital shield of ♂. 13–14, Ventral and dorsal views of idiosoma of ♀. 15, Dorsal view of idiosoma of protonymph.

punctate and marked by muscle insertions. Shield with three setae on each anterolateral margin; also three pairs of setae in mid-longitudinal line, of which the central pair is set decidedly further back than in remaining material. Anterior (mesonotal) fragment of opisthonotal shield not as strongly delimited, almost semicircular behind rectilinear anterior margin; with eight (rarely seven) enlarged setae. Posterior (pygidial) fragment of opisthonotal shield transversely oval; asetose. Stigmata with much abbreviated peritremes. Dorsal body cuticle with four shieldlets anterolaterally, and seven pairs of setae (sixth and seventh pairs enlarged and approximated as in original illustration of *T. platycerci*).

Sternal shield (Fig. 13) well defined, reticulate, and with some punctae; tapered distinctly between SI and extending back just behind SII. SI-III free in cuticle. Metasternal setae absent. Genital shield ligulate, irregularly marked, and bearing two setae; associated pores free in cuticle. Anal shield rounded anteriorly, more heavily sclerotized laterally; cribrum present. Anus centrally placed, preceded by adanal setae; postanal seta absent. Ventral cuticle with ten setae arranged 2.4.4.

Legs with setae short and spinose on anterodorsal aspect, but long and tapering ventrodistally (Figs 8-9). Coxae 2.2.2.1. Trochanter I (0-1/2-0), II (2-0/2-0), III-IV (1-0/3-0). Femur I (2-4/2-2), II (2-4/1-1), III (1-4/1-0), IV (1-3/0-0). Genu I (2-4/2-2), II-III (2-4/0-2), IV (2-4/1-1). Tibiae (2-3/2-1). Tarsi—.18.18.18 (*mv* present). Ambulacrum I weaker than II-IV.

Basis capituli (Fig. 11) normally with two capitular setae, but one often absent. Several fine deutosternal denticles present. Hypostome with three pairs of setae, HI strongest, HIII weakest. Palpal tarsus obscured dorsally by tibia; setal formula 0.2.4.7(6), mostly minute, but one or two on tibia long and slender. Chelicerae 80-85μ long, chelate portion occupying one-quarter of total length. Tritosternum with hyaline edges on base, and two distally spiculate laciniae.

Male.—Idiosoma 460μ long in relatively unengorged specimen. Dorsum as in female, but shields slightly smaller; podonotal shield 223×223μ.

Sternogenital shield (Fig. 12) irregular in outline, bearing SI, but SII-III free in cuticle; genital setae on shield (one missing on one side of one specimen), with accompanying pores on shield in one specimen, off in other. Genital aperture in front of SI. Texture of sternal and genital areas as in female. Remainder of venter as in female.

Legs as in female, but one seta may be lacking on genua-tibiae III-IV; one specimen also shows femur IV 4.5.

Capitulum as in female, except for spermatodactyl on chelicera (Fig. 10).

Protonymph.—Dorsum (Fig. 15) as in adult, but shields and mesonotal setae not so strongly developed.

Sternal area with six setae. Ventral cuticle immediately behind coxae IV probably with six setae arranged 2.?4. Anal shield flanked posteriorly by about five setae.

Chaetotaxy of coxae and trochanters as in adult, but trochanter IV not very clear. Femur I as in adult, II probably (1-4/1-1), III (1-3/1-0), IV as in adult on one side, (1-3/1-0) on other. Genu I (1-4/2-1). II-IV (1-4/0-1). Tibiae (1-3/2-1). Tarsi—.17.17.17 (*mv* absent). Tarsus I essentially as in adult.

Capitulum essentially as in female.

Tinaminyssus trichoglossi (Domrow), n. comb.

(Fig. 7)

Mesonyssoides trichoglossi Domrow, 1964, *J. ent. Soc. Qd*, 3: 29. *Mesonyssus trichoglossi,* Wilson, 1964, *Pacif. Insects*, 6: 378; 1966, *Ibid.*, 8: 766: 1968, *J. Parasit.*, 54: 400. Domrow, 1966, Proc. Linn. Soc. N.S.W., 90: 191. *Mesonyssus neopsittaci* Wilson, 1964, *Pacif. Insects*, 6: 372; 1966, *Ibid.*, 8: 759; 1968, *J. Parasit.*, 54: 397. New synonymy. *Mesonyssus domicellae* Wilson, 1964, *Pacif. Insects,* 6: 375; 1968, *J. Parasit.*, 54: 397. New synonymy. *Mesonyssus chalcopsittae* Wilson, 1968, *J. Parasit.*, 54: 395. New synonymy.

Previous records (all Psittacidae, Psittaciformes).—Rainbow-lorikeet. *Trichoglossus moluccanus* (Gmelin), Tamborine and Logan Villages. Also Esk and Kowanyama. Scaly-breasted lorikeet, *T. chlorolepidotus* (Kühl). Tamborine and Logan Villages. Also Esk. Little lorikeet, *Glossopsitta pusilla* (Shaw), Esk.

The above four nominal taxa were based on variation in number and strength of setae, beginning on the dorsal shields and free segments of the legs, and extending finally onto the coxae and venter. Moreover, host-specificity is not absolute (Wilson, 1966*b*), and I now consider this variation clinal, in the direction: *T. neopsittaci*—unnamed form from *Glossopsitta* (Fig. 7)—typical form of *T. trichoglossi*—unnamed form from *Trichoglossus* recognized by Domrow (1964*a*) and figured by Wilson (1964)—*T. domicellae*—*T. chalcopsittae.*

The following specimens housed in the Australian Museum, Sydney, and examined through the courtesy of Mr. C. N. Smithers, are listed for historical reasons, being among the first nasal mites of birds ever collected. Prior to 1892, all known species were European, one having been described by Giebel (1871) and three by Berlese and Trouessart (1889). The first Australian rhinonyssine was described by Hirst (1921*b*), and work in this region was resumed by Domrow (1964*a et seq.*).

The series comprises 3♀♀ (in fair condition) from *T. moluccanus* (listed on the label under its synonym *T. multicolor* (Gmelin)), Tweed River, N.S.W., ii.1892, T. Steel (Carter, 1926, Proc. Linn. Soc. N.S.W., 51: vii. gives a brief biography). All the specimens agree with the variety noted in the original description.

Tinaminyssus belopolskii (Bregetova), n. comb.

Neonyssus belopolskii Bregetova, 1950, *Dokl. Akad. Nauk SSSR,* 71: 1005; Strandtmann, 1956, *J. Kans. ent. Soc.,* 29: 137; Mitchell, 1961, *SWest. Nat.,* 6: 105. *Mesonyssus belopolskii,* Domrow, 1965, *Acarologia,* 7: 433: 1966, Proc. Linn. Soc. N.S.W., 90: 191; Wilson, 1968, *J. med. Ent.,* 5: 213. *Neonyssus ardeae* Zumpt and Till, 1955, *J. ent. Soc. sth. Afr.,* 18: 63; Fain. 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 53, 137. *Neonyssus bubulci* Zumpt and Till, 1955, *J. ent. Soc. sth. Afr.,* 18: 66; Fain, 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 54. New synonymy. *Neonyssus ixobrychi* Fain. 1956, *Revue Zool. Bot. afr.,* 53: 134; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 54. New synonymy. *Neonyssus marcandrei* Gretillat. Capron, and Brygoo, 1959, *Acarologia,* 1: 379. *Mesonyssus belopolskii nycticoracis* Fain. 1961, *Acarologia,* 3: 516.

Previous records (all Ardeidae, Ciconiiformes).—Plumed egret, *Egretta intermedia* (Wagler). Little egret, *E. garzetta* (Linnaeus). Cattle egret (introduced), *Bubulcus ibis* (Linneaus). White-faced heron, *Notophoyx novaehollandiae* (Latham), Esk. Also Charleville, Tin Can Bay, Mt. Jukes, and Kowanyama. Pied heron, *Notophoyx picata* (Gould), Kowanyama. Little bittern, *Ixobrychus minutus* (Linnaeus).

I have been able to examine the following material of *N. bubulci* from the type-host, *B. ibis*: 1 ♀ and 1 ♂ paratype (Transvaal), 1 ♀ and 1 ♂ (Bechuanaland), and 2 ♀♀ (Rwanda), the last four specimens bearing Fain's identifications. As described, this taxon shows the opisthonotal shield broader than is usual in the other five taxa listed above, but one of the two specimens from Rwanda is intermediate in this respect, and I therefore accept the synonymy. The synonymy of *N. ixobrychi*, reasonably clear from the published data, is confirmed by a study of the holotype ♀ from Rwanda. All six taxa are restricted to ardeid hosts.

TINAMINYSSUS EPILEUS (Wilson), n. comb.

Mesonyssus epileus Wilson, 1964, *Pacif. Insects*, 6: 358; 1965, *Ibid.*, 7: 638.

Previous record.—Crested hawk, *Aviceda subcristata* (Gould) (Accipitridae, Falconiformes).

Three paratype ♀♀ from the above (type) host all show trochanter II 5, rather than 4.

TINAMINYSSUS MELLOI (de Castro), n. comb.

Neonyssus (*Neonyssus*) *melloi* de Castro, 1948, *Archos Inst. biol., S Paulo,* 18: 270. *Mesonyssus melloi*, Domrow, 1965, *Acarologia*, 7: 434; 1966, PROC. LINN. SOC. N.S.W., 90: 192; Wilson, 1966, *J. Parasit.,* 52: 1211. *Mesonyssus melloi streptopeliae* Fain, 1962, *Revue Zool. Bot. afr.*, 65: 310. *Mesonyssus streptopeliae,* Fain, 1965, *Revue Zool. Bot. afr.,* 72: 159. *Neonyssus hirsutus* Feider, 1962, *Studii Cerc. stiint. Iăsi,* 13: 58. New synonymy.

Previous records (all introduced Columbidae, Columbiformes).—Domestic pigeon, *Columba livia* Gmelin, Brisbane. Indian turtle-dove, *Streptopelia chinensis* (Scopoli), Brisbane. Senegal dove, *S. senegalensis* (Linnaeus).

New host records.—White-headed pigeon, *C. norfolciensis* Latham, Wilson's Peak, 15.v.1967, R. D. and B. H. K. (16 ♀♀, 11 ♂♂). Wonga pigeon, *Leucosarcia melanoleuca* (Latham) (Columbidae), Mt. Keira, 19.xi. 1967, H. B. (1 ♀).

This latter host was banded by Mr. H. Battam, Cronulla, who noted several of these mites in and around the right nostril. When they were disturbed, two or three crawled into the open beak, others withdrew into the nostril, and only one was captured.

TINAMINYSSUS OCYPHABUS (Domrow), n. comb.

Mesonyssus ocyphabus Domrow, 1965, *Acarologia*, 7: 437.

Previous record.—Crested pigeon, *Ocyphaps lophotes* (Temminck) (Columbidae, Columbiformes), Samford and Condamine. Also Esk, Charleville, Augathella, Longreach Lagoon, and Kowanyama.

New host record.—Squatter-pigeon, *Geophaps scripta* (Temminck) (Columbidae), Kowanyama, 1.iv.1965, R. D. (2 ♀♀).

My original comparison (1965*c*) of the legs of this species with those of *T. geopeliae* Fain (1964*c*) would imply that ambulacrum I is modified. In fact, it does not differ appreciably from II-IV.

Both specimens from *Geophaps* Gray are typical of the original description, except that the posterior seta on coxae I-III is relatively weaker, only 6–7 pairs of setae are present on the ventral body cuticle, and the central two pairs of setae on the opisthonotal shield are obsolescent or absent. Leg chaetotaxy as in specimens from the type host, *O. lophotes.* Coxae 2.2.2.1. Trochanters I–III (1–0/2–1), IV (1–0/3–1). Femora I–II (1–4/3–1), III–IV (1–3/1–0). Genu I (1–4/2–1), II–III (1–4/0–1), IV (1–3/0–0). Tibiae (1–3/2–1). Tarsi—.17.17.17 (*mv* present; basitarsi trisetose).

TINAMINYSSUS HIRTUS (Wilson), n. comb.

Mesonyssus hirtus Wilson, 1966, *J. Parasit.*, 52: 1210; 1968, *J. med. Ent.*, 5: 215.

This species, originally described from a member of the genus *Chalcophaps* Gould in the Philippines and New Guinea, may now be recorded from Australia: 4 ♀♀ from a green-winged pigeon, *C. chrysochlora* (Wagler) (Columbidae, Columbiformes), Wilson's Peak, 15.v.1967, R. D. and B. H. K.

TINAMINYSSUS COLUMBAE (Crossley), n. comb.

Neonyssus (*Neonyssus*) *columbae* Crossley, 1950, *Proc. ent. Soc. Wash.*, 52: 309. *Mesonyssus columbae,* Domrow, 1965, *Acarologia,* 7: 440; Wilson, 1966, *J. Parasit.,* 52: 1211.

Previous records (both Columbidae, Columbiformes).—Domestic pigeon (introduced), *Columba livia* Gmelin. Crested pigeon, *Ocyphaps lophotes* (Temminck), Esk.

TINAMINYSSUS MEGALOPREPIAE, n. sp.

(Figs 16–24)

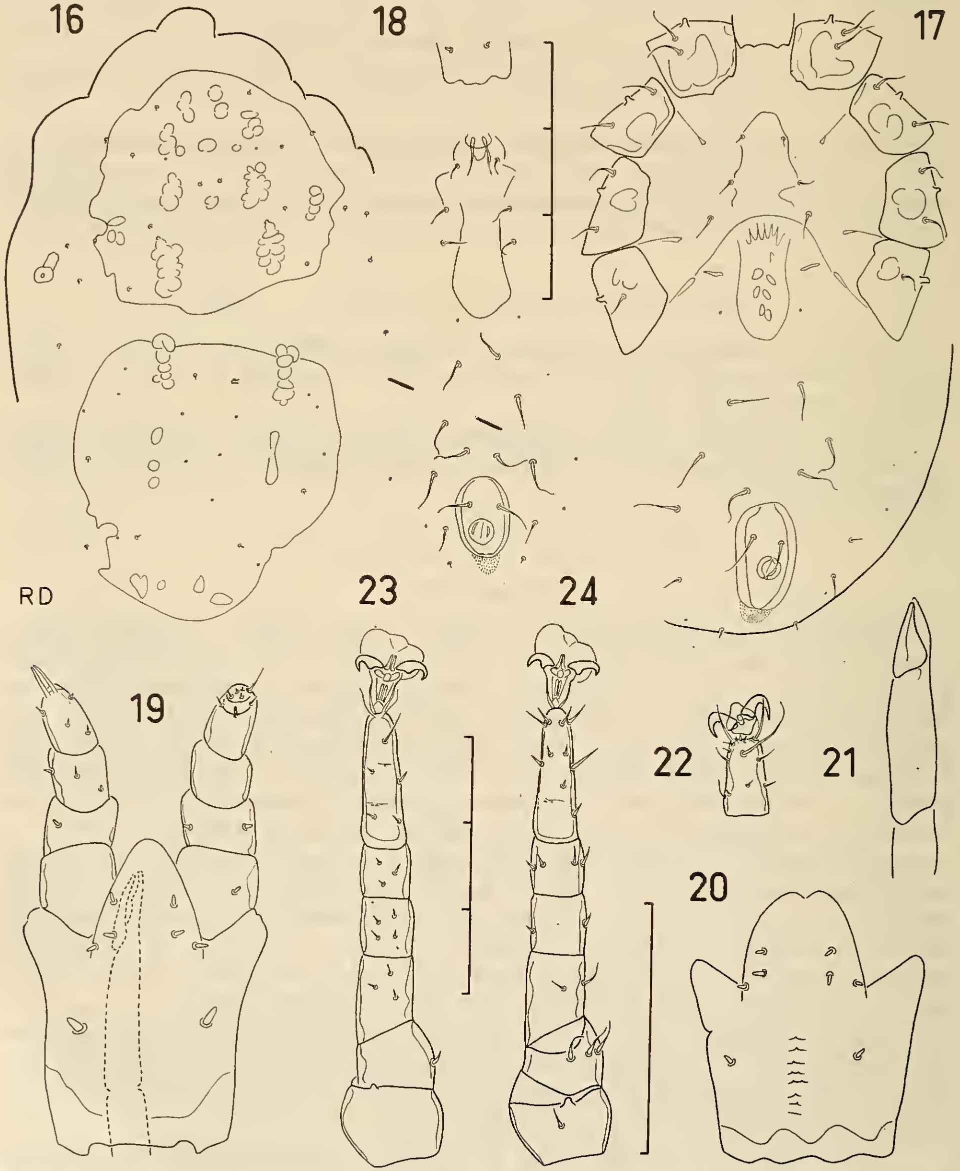
Diagnosis.—In Wilson's key (1964) to the species of *Tinaminyssus* from columbiforms, *T. megaloprepiae* comes nearest to *T. ptilinopi* (Wilson). However, the new species differs in showing (*i*) the opisthosomal setae few and uniform ventrally, *i.e.* midanterior pair not obsolescent; (*ii*) a cribrum; and (*iii*) distinct capitular setae and deutosternal denticles. The setal formulae for the legs given below also differ from those provided by Wilson, although I should note that, in a paratype from *Ptilinopus perlatus zonurus* Salvadori, trochanter I is (1–0/2–1) and the tibiae (1–3/2–1).

Specimens of *T. phassae* (Wilson, 1966*a*), n. comb., lacking the postanal seta would also key to this couplet, but *T. megaloprepiae* is distinct in the same three items cited above. There are also differences in the setal formulae of the leg segments, although I should note that a paratype of *T. phassae* shows trochanter I (1–0/2–0), genu I (1–4/2–1), and tarsi—.18.18.17 (*mv* present, basitarsi II–III with four, but IV with three setae).

Types.—Holotype female, allotype male, two paratype males, and one protonymph from a wompoo pigeon, *Megaloprepia magnifica* (Temminck) (Columbidae, Columbiformes), Maalan, 17.viii.1965, R. D. and J. S. W. Holotype and allotype N. I. C.; paratypes R. D.

Female.—Idiosoma 737μ long in slightly distorted specimen figured. Podonotal shield (Fig. 16) 281×304μ, well defined, but with irregular margins; surface reticulate, closely punctate, and marked by muscle insertions; with 13 setae and two pores. Opisthonotal shield 322×317μ, of similar texture, narrowed posteriorly, and not encroaching onto venter; with six setae (one of which is double) and 13 pores arranged as figured. Marginal cuticle with about four pairs of setae. All dorsal setae minute, slightly tapered rods. Peritremes as long as diameter of stigmata; poststigmatic shields absent.

Sternal shield irregular (Fig. 17), delimited only by cessation of cuticular striae, textures except for few punctae, without pores. SI–III increasing in length in that order, slightly inflated basally; SI-II submarginal, III free in cuticle. Metasternal setae absent. Genital shield drop-



Figs 16–24. *Tinaminyssus megaloprepiae*, n. sp. (from *Megaloprepia magnifica*).– 16–17, Dorsal and ventral views of idiosoma of ♀. 18, Ventral shields of ♂. 19, Ventral view of capitulum of ♀, with deutosternum omitted (right palp in dorsal view). 20, Ventral view of basis capituli of ♂. 21, Chelicera of ♂. 22, Dorsal view of tarsus I of ♀. 23–24, Dorsal and ventral views of leg IV of ♀.

shaped, shagreened, with muscle insertions and rayed operculum. Genital setae absent, but attendant pores present in adjacent cuticle. Anal shield almost twice as long as wide (134×76μ), rounded anteriorly, and with subparallel, sclerotized lateral margins. Definite cribrum present. Anus centrally placed, preceded by elongate adanal setae; postanal seta absent. Ventral cuticle with several pores and 12 basally expanded setae, of which mid-anterior two are not at all reduced, although posterior five are.

Legs with setae on coxae and trochanters similar to those on venter, but remainder generally much shorter and more spinose, particularly on dorsal aspect (Figs 23–24). Coxae without ventral excrescences. Coxae 2.2.2.1. Trochanter I (1–0/2–1), II (2–0/2–1), III–IV (2–0/2–0). Femur I (1–4/2–1), II (1–4/1–1) on one side and (1–4/2–1) on other, III (1–4/1–0), IV (1–3/1–0). Genu I (1–4/2–1), II–IV (1–4/0–1). Tibiae (1–3/2–1). Tarsi –. 17.17.17 (*mv* present, but basitarsi trisetose). Ambulacrum I with pretarsus much shorter, claws slightly stronger (and with correspondingly larger articulatory sclerites), and pulvillus less extensive than II-IV (Fig. 22).

Basis capituli with two capitular setae (Fig. 19); deutosternal denticles as in male (Fig. 20). Hypostome with three pairs of setae. Palpal tarsus not completely obscured dorsally by tibia; setal formula 1.3.3/2.8 (vague, apparently internal structure figured between two ventrodistal setae of tibia may be remnant of claw). All setae on capitulum in form of stout rods, except those on more distal segments of palpi (especially one on tarsus). Chelicerae not in full lateral view, but 116μ long, with chelate portion occupying one-quarter of total length. Tritosternum absent.

Male.—Idiosoma 550–605μ long in slightly distorted specimens. Dorsum as in female, but with some tendency for opisthonotal shield to encroach onto sides of body. Podonotal shield 250–264μ long, 273–286μ wide.

Venter as in female, except for genital aperture in front of SI (Fig. 18).

Legs as in female, but femur I (1–4/1–1) once, II (1–4/2–1) twice, III (1–4/0–0) twice and (1–3/0–0) twice; genu IV (1–3/0–1) once. One specimen is teratological, showing femur-tibia I (1–0/2–1) because all 4.4.3 setae on dorsal aspect are lacking.

Capitulum as in female, with distinct deutosternal denticles (Fig. 20). Chelicerae with spermatodactyl (Fig. 21).

TINAMINYSSUS GEOPELIAE (Fain), n. comb.

Mesonyssus geopeliae Fain, 1964, *Revue Zool. Bot. afr.*, 70: 33; Domrow, 1965, *Acarologia*, 7: 440; 1966, Proc. Linn. Soc. N.S.W., 90: 192; Wilson, 1966, *J. Parasit.*, 52: 1211.

Previous records (both Columbidae, Columbiformes).—Peaceful dove, *Geopelia placida* Gould, Kowanyama. Also Charleville. Bar-shouldered dove, *G. humeralis* (Temminck), Samford. Also Esk and Kowanyama.

New host record.—Diamond-dove, *G. cuneata* (Latham), Charleville, 1.ii. 1967, R. D. and J. S. W. (6 ♀♀, 4 ♂♂).

The specimens from *G. cuneata* closely resemble the original descriptions, except that a minute postanal seta is present, and the seta in the posterior angles of coxae I–III, and the bosses on coxae II–IV are weaker.

TINAMINYSSUS PTILINOPI (Wilson), n. comb.

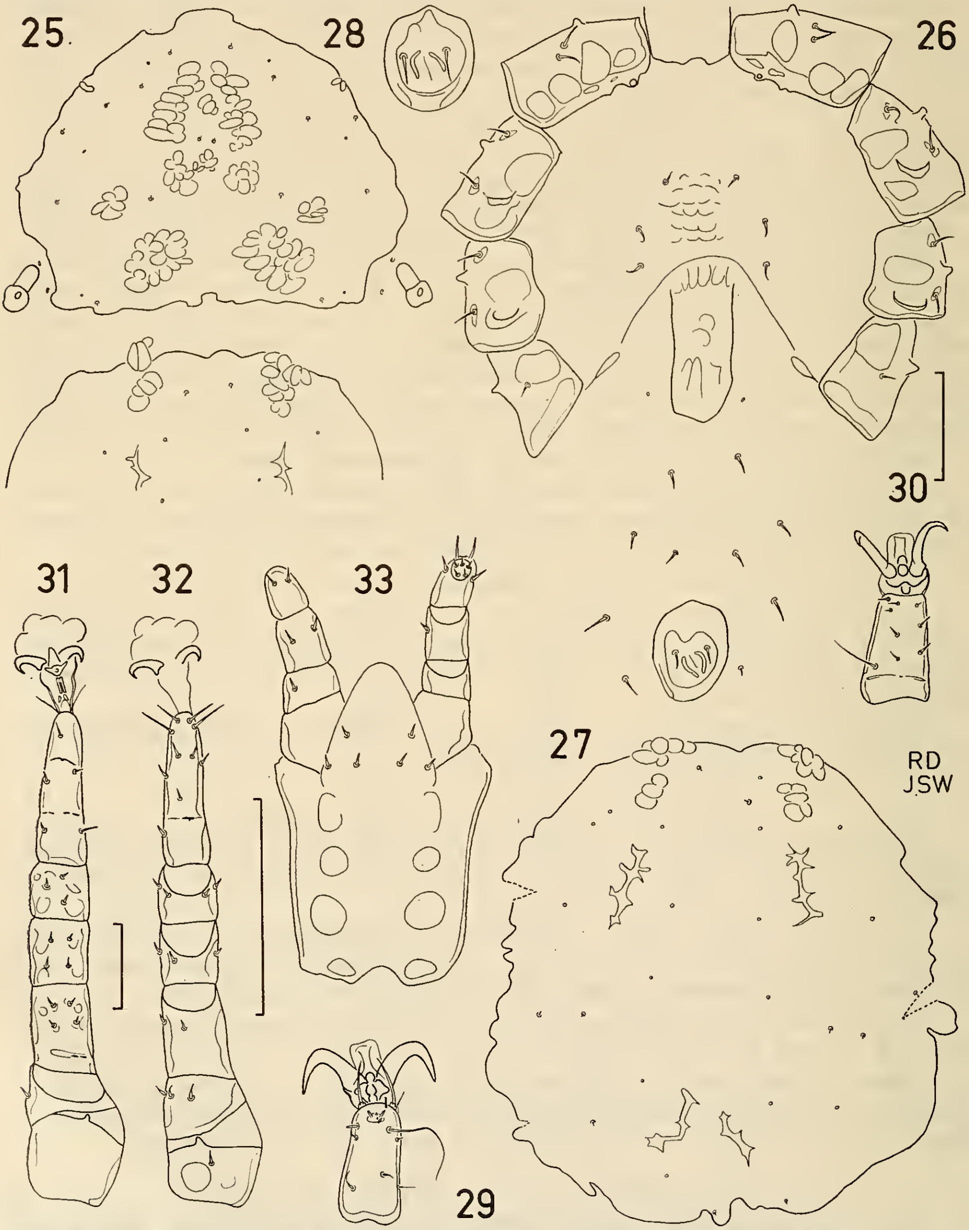
Mesonyssus ptilinopi Wilson, 1964, *Pacif. Insects*, 6: 366; 1965, *Ibid.*, 7: 638; 1966, *J. Parasit.*, 52: 1212; 1968, *J. med. Ent.*, 5: 221.

Previous record.—Purple-crowned pigeon, *Ptilinopus superbus* (Temminck) (Columbidae, Columbiformes).

TINAMINYSSUS MYRISTICIVORAE, n. sp.
(Figs 25–33)

Mesonyssus sp. *"A"* Domrow, 1967, PROC. LINN. SOC. N.S.W., 91: 215.

Diagnosis.—In Wilson's key (1964) to the species of *Tinaminyssus* from columbiform birds, *T. myristicivorae* comes nearest *T. treronis* (Fain), n. comb. However, the new species differs in showing (*i*) considerably shorter setae ventrally on the legs and opisthosoma, on which latter the midanterior



Figs 25–33. *Tinaminyssus myristicivorae,* n. sp. (♀ from *Myristicivora spilorrhoa*).—25–26, Dorsal and ventral views of idiosoma (opisthonotal shield incomplete). 27, Opisthonotal shield (much flattened). 28, Anal shield. 29–30, Dorsal and ventral views of tarsus I. 31–32, Dorsal and ventral views of leg IV. 33, Ventral view of capitulum (right palp in dorsal view).

pair is not obsolescent; (*ii*) claw I considerably stronger than II–IV; and (*iii*) no elongate seta on the palpal tibiotarsus.

There are also differences in leg chaetotaxy, that of the holotype of *T. treronis* being coxae 2.2.2.1; trochanter I (0–1/2–1), II (0–0/3–1), III (1–0/3–0), IV (1–0/4–0); femur I (0–4/3–1), II (0–4/2–1), III (0–4/2–0), IV (0–3/2–0); genu I (1–4/2–1), II–III (0–4/2–1), IV (0–4/2–0); tibiae (1–3/2–1); tarsi—.17.17.17 (*mv* present, but basitarsi trisetose).

T. myristicivorae is separable from the more recently described *T. phassae* (Wilson, 1966*a*) in showing considerably enlarged claws on tarsi I and uniform ventral opisthosomal setae. See also above diagnosis of *T. megaloprepiae*, n. sp., for comments on the leg setation of *T. phassae*, which also differs in detail from that of *T. myristicivorae*.

Types.—Holotype female and two paratype females from a Torres Strait pigeon, *Myristicivora spilorrhoa* (Gray) (Columbidae, Columbiformes), Kowanyama, 22.x.1966, R. D. Holotype N. I. C.; paratypes R. D.

Female.—Idiosoma 605–638μ long in ruptured specimens. Podonotal shield (Fig. 25) 273–276μ long and 366–370μ wide; well defined anteriorly and posteriorly, but with eroded margins and posterolateral excavations at level of peritremes. Surface reticulate, closely punctate, and marked by muscle insertions; with eight pairs of minute setae and three pairs of pores. Opisthonotal shield (Fig. 27) of similar texture, expanded posterolaterally to encroach onto venter; with four or five pairs of minute setae and about eight pairs of pores arranged as figured. Marginal cuticle with few pores near peritremes. Poststigmatic shields absent.

Sternal shield (Fig. 26) indicated only by cessation of cuticular striae; without pores, but with few scale-like markings. SI submarginal, but II–III free in adjacent cuticle. Metasternal setae absent. Genital complex as in *T. megaloprepiae*, n. sp. Anal shield (Fig. 28) slightly longer than wide, 102×94μ, more heavily sclerotized marginally; without cribrum. Anus centrally placed, with adanal setae near its anterior margin; postanal seta absent. Ventral cuticle with about five pairs of short setae, which are only slightly expanded basally, and of which midanterior pair is not obsolescent.

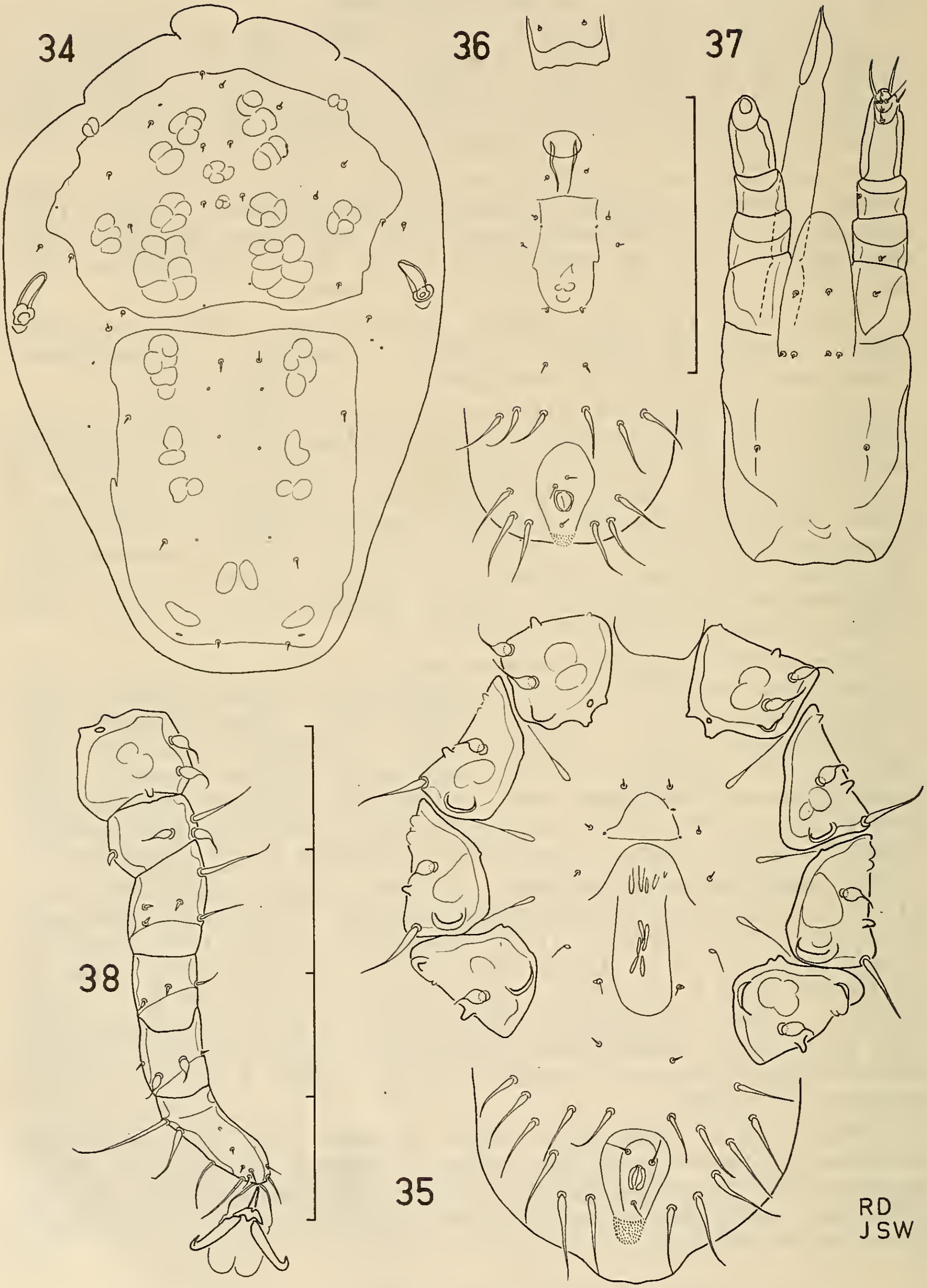
Leg setae also short, particularly on dorsal surface (Figs 31–32). Coxae II–III with sclerotized crescent posteroventrally. Coxae 2.2.2.1. Trochanter I (1–0/2–1), II (2–0/2–1), III–IV (2–0/2–0). Femur I (1–4/3–1) but (1–4/2–1) twice, II (1–4/2–1), III (1–4/1–1) but (1–4/2–1) once, IV (1–4/1–0). Genu I (1–4/2–1), II–III (1–4/0–1), IV (1–4/1–1). Tibiae (1–3/2–1). Tarsi—.18.18.17 (*mv* present; basitarsi II–III with four, but IV with three setae). Ambulacrum I (Figs 29–30) with very short pretarsus and internally sclerotized, truncate pulvillus. Claw I very considerably stronger than II–IV.

Basis capituli (Fig. 33) without capitular setae and deutosternal denticles. Hypostome with three pairs of subequal, spinose setae. Palpal tarsus completely obscured dorsally by tibia; setal formula 0.1.3.6. Chelicerae 116μ long, with chelate portion occupying one-quarter of total length. Tritosternum absent.

TINAMINYSSUS PHABUS (Domrow), n. comb.

Mesonyssus phabus Domrow, 1965, *Acarologia*, 7: 435.

Previous record.—Common bronzewing, *Phaps chalcoptera* (Latham) (Columbidae, Columbiformes), Esk. Also Charleville.



Figs 34–38. *Tinaminyssus macropygiae* (Wilson) (from *Macropygia phasianella*).–34–35, Dorsal and ventral views of idiosoma of ♀. 36, Ventral shields of ♂. 37, Ventral view of capitulum of ♀, with dorsal setation of right palp not shown. 38, Ventral view of leg I of ♀.

TINAMINYSSUS MACROPYGIAE (Wilson), n. comb.

(Figs 34–38)

Mesonyssus macropygiae Wilson, 1966, *Pacif. Insects,* 8: 607; 1968, *J. med. Ent.,* 5: 215.

This species may now be recorded from Australia, the original series being from New Guinea and the Philippines: 19 ♀♀ and 4 ♂♂ from brown pigeons, *Macropygia phasianella* (Temminck) (Columbidae, Columbiformes), Ella Bay and Jordan Creek, 4 and 18.viii.1965, respectively, R. D. and J. S. W.; also 10 ♀♀ and 2 ♂♂, Wilson's Peak, 15.v.1967, R. D. and B. H. K.

Dr. Wilson has kindly confirmed the identity of my material.

TINAMINYSSUS WELCHI, n. sp.

(Figs 39–47)

Mesonyssus sp. *"B"* Domrow, 1967, PROC. LINN. SOC. N.S.W., 91: 215.

Diagnosis.—In Wilson's key (1964), *T. welchi* falls near *T. gourae* (Wilson), n. comb. The two species also show ambulacrum I modified and (as far as can be judged from Wilson's heavily stippled figure) podonotal and opisthonotal shields similar in both their shape and their setation. However, the basally expanded setae on all coxae and the venter of *T. welchi* immediately separate the two species, and further minor differences are to be seen in the armature of coxa IV and the width of the genital shield.

Of the more recently described species from the Australian region, *T. phabus* (Domrow, 1965*c*) and *T. macropygiae* (Wilson, 1966*a*) also show coxal processes and basally expanded setae on the legs, but differ from *T. welchi* in the details of this armature as well as in the shape and setation of the opisthonotal shield and the setation of the venter.

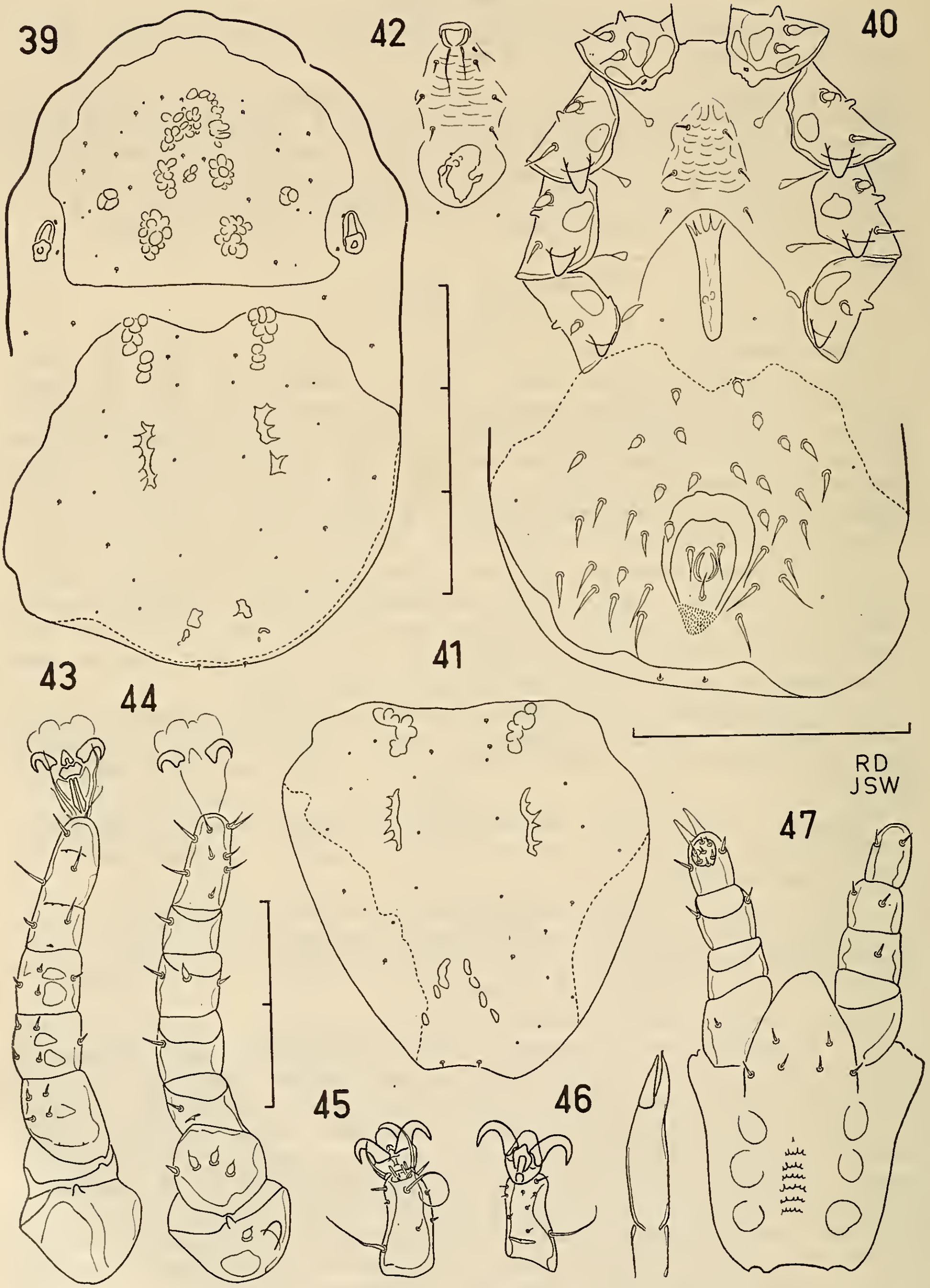
Of the remaining two parasites of columbids briefly diagnosed by Wilson (1966*a*, 1968*b*), *T. angustus* (Wilson), n. comb., is said to have a rectangular opisthonotal shield, and *T. peleiae* (Wilson), n. comb., distinct poststigmatic shields.

Finally, *T. welchi* recalls the neotropical *T. castroae* (do Amaral, 1963*a*), n. comb., which is, however, unique in showing basally expanded genital and sternal setae as well.

Types.—Holotype female, allotype male, five paratype females, and one deutonymph from a Torres Strait pigeon, *Myristicivora spilorrhoa* (Gray) (Columbidae, Columbiformes), Kowanyama, 22.x.1966, R. D. Holotype and allotype N. I. C.; paratypes R. D. and A. F.

Female.—Idiosoma (moderately engorged) 627–660μ long and 385–396μ wide in four somewhat compressed specimens; 627 x 374μ in one unflattened specimen. Podonotal shield (Fig. 39) irregularly arched anteriorly, excavated posterolaterally around stigmata, and rectilinear posteriorly; with eight pairs of minute setae in addition to paired pores and muscle insertions. Opisthonotal shield concave anteriorly and expanded posterolaterally to encroach broadly (Fig. 41) onto venter in unfed, and slightly so in fed specimens; with four pairs of setae (including pygidial pair) in addition to paired pores and muscle insertions. Both shields distinctly reticulate and heavily stippled in entirety. Stigmata with short peritremes; poststigmatic shields absent; adjacent cuticle with four pairs of minute setae.

Sternal shield (Fig. 40) subpentagonal, delineated only by cessation of cuticular striae, very weakly sclerotized, and textureless except for weak scalation; SI and II on shield, III free in cuticle (only one SI in one specimen). Metasternal setae absent. Genital shield narrow, shagreened, and with



Figs 39–47. *Tinaminyssus welchi*, n. sp. (from *Myristicivora spilorrhoa*).–39–40, Dorsal and ventral views of idiosoma of ♀. 41, Opisthonotal shield of unengorged ♀. 42, Sternogenital shield of ♂. 43–44, Dorsal and ventral views of leg IV of ♀. 45–46, Dorsal and ventral views of tarsus I of ♀. 47, Ventral view of capitulum of ♀, with inset of chelicera (left palp in dorsal view).

weak muscle insertions; operculum rayed; genital setae as in *T. megaloprepiae*, n. sp. Anal shield well sclerotized marginally, but transparent centrally; adanal setae level with front of anus, subequal to postanal seta; cribrum present. Ventral cuticle with two to four pores and 34–42 setae, of which 14–16 are basally expanded, with short terminal filament, while remainder are normal, *i. e.* elongate.

Coxae II–IV armed posteriorly—this armature is not simply the crescentic thickening found in *T. ocyphabus* (Domrow, 1965*c*), or the rosette of *T. geopeliae* (Fain, 1964*c*), but a strong, distinctly protruding spur analogous to those present in many species of *Echinonyssus* Hirst and *Trichosurolaelaps* Womersley (see Domrow, 1966*a*). Coxae 2.2.2.1. Trochanter I (1–0/2–1), II (1–0/3–1) but (1–0/3–0) once, III–IV (1–0/3–0). Femur I (1–4/3–1), II (1–4/2–1) but (1–4/3–1) twice and (1–4/2–0) once, III (1–5/1–0) but (0–5/1–0) once, IV (1–4/0–0) but (0–4/0–0) once. Genu I (1–4/2–1), II–IV (1–4/0–1). Tibiae (1–3/2–1). Tarsi—.18.18.17 (*mv* present; basitarsi II–III with four, but IV with three setae). Only the above six variations were noted in the 270 segments checked. Both setae on coxa I, anterior seta on coxae II and III, and seta on coxa IV modified; posterior seta on coxa II and III normal. Modified setae present on venter of remaining segments as follows: one to three on disc of trochanters, and one (often weak) on femur-tibia I and femora and tibiae II–IV. Some tarsal setae slightly expanded basally. Tarsus I incrassate (Figs 45–46), strongly sclerotized, and with dorsodistal sensory islet; pretarsus shorter, claws stronger, and pulvillus smaller (yet less diaphanous) than II–IV.

Basis capituli (Fig. 47) well sclerotized; with about six rows of deutosternal denticles, but without capitular setae. Hypostome with three pairs of subequal setae. Palpi with five free segments, but tarsus obscured dorsally by tibia; setal formula 1.1.4.6. Tarsus with about seven minute setae. All setae on capitulum spine-like. Chelicerae with digits occupying one-quarter of total length (Fig. 47). Tritosternum absent.

Male.—Similar to female, but smaller, idiosoma 495μ long.

Genital area of sternogenital shield hyaline marginally, with very irregular, but strongly sclerotized patch discally (Fig. 42). Venter of opisthosoma with four expanded setae on one side and seven on other; eleven normal setae on each side.

Leg chaetotaxy as in female, except coxa II lacking *pv*, femur III (0–5/1–0), and IV (1–4/1–0) (all on one side only).

Spermatodactyl as long as cheliceral digits.

TINAMINYSSUS HALCYONUS (Domrow), n. comb.

Mesonyssus halcyonus Domrow, 1965, *Acarologia*, 7: 443; Wilson, 1966, *Pacif. Insects*, 8: 609; 1968, *J. med. Ent.*, 5: 213. *Falconyssus halcyonus*, Fain, 1966, *Revue Zool. Bot. afr.*, 74: 86.

Previous records (both Alcedinidae, Coraciiformes).— Sacred kingfisher, *Halcyon sanctus* Vigors and Horsfield, Logan Village and Brisbane. Also Esk, Charleville, Winbin Ck., Half Tide, Innisfail, and Kowanyama. Mangrove-kingfisher, *H. chloris* (Boddaert).

New host records.—Red-backed kingfisher, *H. pyrrhopygius* Gould, Kowanyama, 27 and 30.iii, and 17.iv.1965, R. D. and J. S. W. (11♀♀, 2♂♂, 4 nymphs). Forest kingfisher, *H. macleayii* Jardine and Selby, Innisfail, 3.viii.1965, R. D. and J. S. W. (22♀♀, 6♂♂, 3 nymphs); Kowanyama, 29.iii, 7 and 14.iv.1965, and 12.iii.1967, R. D., B. H. K., H. A. S., and J. S. W. (8♀♀, 1♂).

All specimens are similar dorsally. However, those from *H. pyrrhopygius* and *H. macleayii* show pointed, not spatulate tarsal claws, while the setae on the ventral cuticle are only slightly inflated basally in the former series, and barely at all in the latter.

TINAMINYSSUS DACELOAE (Domrow), n. comb.

Mesonyssus daceloae Domrow, 1965, Acarologia, 7: 445. *Falconyssus daceloae,* Fain, 1966, *Revue Zool. Bot. afr.,* 74: 87.

Previous records (both Alcedinidae, Coraciiformes).—Laughing kookaburra, *Dacelo gigas* (Boddaert), Samford and Esk. Also Condamine and Mt. Jukes. Blue-winged kookaburra, *D. leachii* Vigors and Horsfield, Chelona. Also Kowanyama.

I regret having formed this specific name in the first, rather than the third declension—*Dacelo* Leach is an anagram of *Alcedo* Linnaeus, and is the basis of the subfamily Daceloninae (see Thomson, 1964). Art. 32, however, forbids any change (Stoll *et al.,* 1964).

Genus LARINYSSUS Strandtmann

Larinyssus Strandtmann, 1948, *J. Parasit.,* 34: 507. Type-species *Larinyssus orbicularis* Strandtmann, 1948, *Loc. cit.,* 507.

Key to females of Australian species of LARINYSSUS

1. Ventral surface of opisthosoma with about ten pairs of setae. Capitular setae present. Two pairs of hypostomal setae present ....*benoiti* Fain
   Ventral surface of opisthosoma with about three pairs of setae. Capitular setae absent. Three pairs of hypostomal setae present ....*orbicularis* Strandtmann

LARINYSSUS BENOITI Fain

Larinyssus benoiti Fain, 1961, *Revue Zool. Bot. afr.,* 63: 128; 1964, *Annls Mus. r. Afr. cent. Sér. 8vo,* 132: 134; Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 196.

Previous records (both Glareolidae, Charadriiformes).— Australian pratincole, *Stiltia isabella* (Vieillot), Kowanyama. Oriental pratincole, *Glareola pratincola* (Linnaeus).

Fain's single female (1960*b*) was originally misidentified as the following species (personal communication).

LARINYSSUS ORBICULARIS Strandtmann

Larinyssus orbicularis Strandtmann, 1948, *J. Parasit.,* 34: 507; Zumpt and Patterson, 1951, *J. ent. Soc. sth. Afr.,* 14: 78; Bregetova, 1951, *Parazit. Sb.,* 13: 117; Fain, 1956, *Revue Zool. Bot. afr.,* 53: 157. *Larinyssus petiti* Gretillat, 1961, *Vie Milieu,* 12: 155. New synonymy.

Previous records (all Laridae, Charadriiformes).—White-winged black tern, *Chlidonias leucoptera* (Temminck). Gull-billed tern, *Gelochelidon nilotica* (Gmelin). Common tern, *Sterna hirundo* Linnaeus. Sooty tern, *Sterna fuscata* Linneaus. This record is based on host-relationship (Amerson, 1967), and I have been unable to obtain specimens to confirm it. Southern black-backed gull (vagrant), *Larus dominicanus* Lichtenstein.

This widespread parasite of gulls and terns may now be recorded from Australia: 16 ♀♀, 2 ♂♂, and 1 protonymph from a crested tern, *Sterna bergii* Lichtenstein (Laridae), estuary of Topsy Creek, 29.x.1966, R. D. and H. A. S.

Repeated attempts to borrow material of Gretillat's species have been in vain, but the host data and some of the original figures make me certain the synonymy is correct. The alleged single dorsal shield, bearing the stigmata and peritremes, is clear evidence that Gretillat has misinterpreted the dorsal surface of this cosmopolitan parasite of larids.

Genus RALLINYSSUS Strandtmann

Rallinyssus Strandtmann, 1948, *J. Parasit.*, 34: 512; Wilson, 1965, *Pacif. Insects*, 7: 623. Type-species *Rallinyssus caudistigmus* Strandtmann, 1948, *Loc. cit.*, 512. *Rallinyssoides* Fain, 1960, *Bull. Annls Soc. r. ent. Belg.*, 96: 295. Type-species *Rallinyssus congolensis* Fain, 1956, *Revue Zool. Bot. afr.*, 53: 396; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 58.

Key to females of Australian species of RALLINYSSUS

1. Circumanal frill absent 2
Circumanal frill present 3
2 (1). Opisthonotal shield present .... *amaurornis* Wilson
Opisthonotal shield absent .... *congolensis* Fain
3 (1). Podonotal shield about as long as wide, with margin extended laterally beyond sublateral row of muscle insertions. First pair of setae behind podonotal shield closely set, not separated by midposterior convexity of shield .... *gallinulae* Fain
Podonotal shield decidedly longer than wide, with margin not extended laterally beyond sublateral row of muscle insertions. First pair of setae behind podonotal shield widely set, separated by midposterior convexity of shield .... *caudistigmus* Strandtmann

RALLINYSSUS AMAURORNIS Wilson

Rallinyssus amaurornis Wilson, 1965, *Pacif. Insects*, 7: 624; 1967, *Philipp. J. Sci.*, 95: 215; 1968, *J. med. Ent.*, 5: 221.

Previous record.—White-browed crake, *Poliolimnas cinereus* (Vieillot) (Rallidae, Gruiformes).

RALLINYSSUS CONGOLENSIS Fain

Rallinyssus congolensis Fain, 1956, *Revue Zool. Bot. afr.*, 53: 396; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 58. *Rallinyssus porzanae* Wilson, 1967, *Philipp. J. Sci.*, 95: 215. New synonymy.

Previous record.—Spotless crake, *Porzana tabuensis* (Gmelin) (Rallidae, Gruiformes).

In view of the variation of the podonotal shield discussed under the following species, the two taxa documented above are also synonymized.

RALLINYSSUS GALLINULAE Fain

Rallinyssus gallinulae Fain, 1960, *Bull. Annls Soc. r. ent. Belg.*, 96: 295; Domrow, 1965, *Acarologia*, 7: 450; Wilson, 1965, *Pacif. Insects*, 7: 634; 1968, *J. med. Ent.*, 5: 221. *Rallinyssus rallus* Wilson, 1965, *Pacif. Insects*, 7: 631. New synonymy.

Previous records (all Rallidae, Gruiformes).—Lewin water-rail, *Rallus pectoralis* Temminck. Banded landrail, *Hypotaenidia philippensis* (Linnaeus), Innisfail. Eastern swamphen, *Porphyrio melanotus* Temminck.

Australian specimens show the podonotal shield, and its accompanying four shieldlets and sixteen setae, arranged as in Wilson's Fig. 4B. However, the shield, while longer than wide, is rounded laterally, and therefore intermediate between Wilson's eroded, and Fain's subcircular form (Fain's Fig. 1, where, incidentally, there is also a trace of the second pair of accessory shieldlets on the right hand side).

Having established this synonymy, it should be pointed out that, by accepting even further reduction of the podonotal shield as still falling within the range of intraspecific variation, the question is raised of the synonymy of the following species (which has priority), and even of *R. verheyeni* Fain (1963*d*), described from *Rallus* Linnaeus. There is nothing in the way of host-specificity to argue against such a step (see Section V below), and the concept of a single, cosmopolitan species with a circumanal frill, from a wide range of rallids, is not unattractive.

In view of the peculiarly displaced stigmata in this genus, one might postulate that the mites assume some definite spatial orientation in the nasal passages of their hosts.

RALLINYSSUS CAUDISTIGMUS Strandtmann

Rallinyssus caudistigmus Strandtmann, 1948, *J. Parasit.*, 34: 512; Bregetova, 1951, *Parazit. Sb.*, 13: 118; Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 196; Wilson, 1968, *J. med. Ent.*, 5: 221.

Previous records (both Rallidae, Gruiformes).—Dusky moorhen, *Gallinula tenebrosa* Gould, Esk. Coot, *Fulica atra* Linnaeus.

Genus RHINONYSSUS Trouessart

Rhinonyssus Trouessart, 1894, *C. r. Séanc. Soc. Biol.*, (10) 1: 723. Type-species *Rhinonyssus coniventris* Trouessart, 1894, *Loc. cit.*, 724. See also note below on *Sternostomum* Trouessart, 1895.

Sommatericola Trägårdh, 1904, "Monographie der arktischen Acariden" (Inaugural Dissertation: Uppsala), p. 28. Type-species *Sommatericola levinseni* Trägårdh, 1904, *Loc. cit.*, 29. This genus is based on *Somateria* Leach, and Neave (1940) also lists the later spelling *Sommateria* Kaup. However, as both these spellings antedate Trägårdh's paper, and it is unlikely he made a change from *Somateria* on his own accord, no change in his spelling seems necessary.

Key to females of Australian species of RHINONYSSUS

1. Anal shield present. Distal segments of palpi forming a compact cone barely larger than trochanter 2
Anal shield obsolescent. Distal segments of palpi cylindrical, noticeably longer than trochanter 3
2 (1). Podonotal shield entire. Setae on venter of opisthosoma normal .... *rhinolethrum* (Trouessart)
Podonotal shield fragmented. Setae on venter of opisthosoma in form of stout spines .... *poliocephali* Fain
3 (1). Sternal shield absent. Genital shield elongate .... *coniventris* Trouessart
Sternal shield present. Genital shield as long as broad 4
4 (3). Podonotal shield with posterior margin subrectilinear. Ventral surface of opisthosoma with 10-12 pairs of setae .... *himantopus* Strandtmann
Podonotal shield with distinct posteromedian extension. Ventral surface of opisthosoma with considerably more, or considerably fewer setae 5
5 (4). Ventral surface of opisthosoma with 20-30 pairs of setae .... *sphenisci* Fain and Mortelmans
Ventral surface of opisthosoma with one pair of setae .... *minutus* (Bregetova)

RHINONYSSUS RHINOLETHRUM (Trouessart)

Sternostomum rhinolethrum Trouessart, 1895, *Revue Sci. nat. appl.*, 42: 393. This is the spelling given in the title and in the formal listing of the new name. The usage *"rinolethrum"* a few lines later is an example of multiple original spelling and should be corrected under Art. 32. van Eyndhoven (1964) says the labels bear a third spelling. Also Bregetova, 1951, *Parazit. Sb.*, 13: 114.

Rhinonyssus rhinolethrum, Strandtmann, 1951, *J. Parasit.*, 37: 132; 1956, *Proc. ent. Soc. Wash.*, 58: 137; Fain, 1956, *Revue Zool. Bot. afr.*, 53: 149; 1958, *Bull. Soc. r. Zool. Anvers*, 9: 9; 1960, *Revue Zool. Bot. afr.*, 61: 108, 62: 91; Mitchell, 1960, *SWest. Nat.*, 5: 107; 1963, *J. Parasit.*, 49: 506; van Eyndhoven, 1964, *Zoöl. Meded., Leiden*, 39: 303; Wilson, 1964, *Pacif. Insects*, 6: 383; 1968, *J. med. Ent.*, 5: 222.

Rhinonyssus rhinolethrus Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 196. Trouessart was at pains to indicate that he considered the correct original spelling *Sternostoma* neuter (Arts 30 and 32,), even to the extent of publishing (1895) the unjustified emendation *Sternostomum* (Art. 33) (*v. infra*). I had therefore considered *rhinolethrum* adjectival and amended its termination under Art. 30. However, I now find *rhinolethrum* is formed neither exactly from the adjective ὀλεθριος (*olethrius*) nor the substantive ὀλεθρος (*olethrus*), and, in the absence of a clear statement by Trouessart that his specific name be treated adjectivally rather than substantivally, revert to the original (indeclinable) spelling *rhinolethrum*.

Rallinyssus rhinolethrum Fain, 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 265. As this entry is immediately preceded by the heading "Genre *Rhinonyssus* . . .", the slip of the pen is obvious, and should therefore be corrected under Art. 32. It should not, presumably, be treated as a new combination.

Sommatericola levinseni Trägårdh, 1904, "Monographie der arktischen Acariden" (Inaugural Dissertation: Uppsala), p. 29. *Sternostomum levinseni*, Bregetova, 1951, *Parazit. Sb.*, 13: 114. *Sternostomum levinsi* (*sic*) Vitzthum, 1935, *J. Orn., Lpz.*, 83: 569. *Rhinonyssus levinseni*, van Eyndhoven, 1964, *Zoöl. Meded., Leiden*, 39: 300. *Rhinonyssus Dartevellei* Fain and Vercammen-Grandjean, 1953, *Revue Zool. Bot. afr.*, 48: 35. The original spelling contravenes Art. 28 and should be corrected to *dartevellei* under Art. 32.

Previous records (all Anatidae, Anseriformes).—Domestic goose, *Anser anser* (Linnaeus). Whistling tree-duck, *Dendrocygna arcuata* (Horsfield) Kowanyama. Black duck, *Anas superciliosa* Gmelin. Garganey teal, *Anas querquedula* Linnaeus. Mallard (introduced), *Anas platyrhynchos* Linnaeus.

New host records.—Maned goose, *Chenonetta jubata* (Latham) (Anatidae), Charleville, 25.i.1967, R. D. and J. S. W. (1 ♀). Grey teal, *Anas gibberifrons* (Müller), Charters Towers, 10.iii.1966, H. J. L. (1♂). Greenshank, *Tringa nebularia* (Gunnerus) (Scolopacidae, Charadriiformes), Kowanyama, 11.xii.1967, R. D. and H. A. S. (1 deutonymph).

Like the single specimen recorded by Strandtmann (1956) from a coot (*Fulica* Linnaeus, Rallidae, Gruiformes) in Thailand, the new specimen from *Tringa* Linnaeus is also best regarded as a straggler — its host was taken at a small swamp where ducks abound. Strandtmann's paper (1958) on the correlation between gregariousness and host-specificity in the Rhinonyssinae should also be consulted. Hirst (1921*a*) compares this species with *R. scoticus*, but the latter is a *nomen nudum*, possibly a discarded manuscript name for one of the other species of *Rhinonyssus* described in the same paper.

RHINONYSSUS POLIOCEPHALI Fain

Rhinonyssus poliocephali Fain, 1956, *Revue Zool. Bot. afr.*, 53: 149; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 45; Domrow, 1965, *Acarologia*, 7: 450.

Previous record.—Little grebe, *Podiceps ruficollis* (Vroeg) (Podicipidae, Podicipiformes), Esk. Also Kowanyama.

RHINONYSSUS HIMANTOPUS Strandtmann

Rhinonyssus himantopus Strandtmann, 1951, *J. Parasit.*, 37: 136; 1956, *Proc. ent. Soc. Wash.*, 58: 132; 1959, *J. Kans. ent. Soc.*, 32: 134; Fain, 1956, *Revue Zool. Bot. afr.*, 53: 149; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 44; 1958, *Bull. Soc. r. Zool. Anvers*, 9: 10; *Explor. Parc natn. Albert deux. Sér.*, 6: 9; 1960, *Revue Zool. Bot. afr.*, 62: 92; 1964, *Annls Mus. r. Afr. cent. Sér. 8vo*, 132: 137; Gretillat, 1961, *Vie Milieu*, 12: 155; Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 195. *Rhinonyssus strandtmanni* Fain and Johnston, 1966, *Bull Soc. r. Zool. Anvers*, 38: 25. New synonymy.

Previous records (all Charadriidae, Charadriiformes). — Red-kneed dotterel, *Erythrogonys cinctus* Gould, Kowanyama. Spur-winged plover, *Lobibyx novaehollandiae* (Stephens), Esk. Masked plover, *L. miles* (Boddaert), Kowanyama. Black-fronted dotterel, *Charadrius melanops* Vieillot, Kowanyama.

New host record.—White-headed stilt, *Himantopus leucocephalus* Gould (Recurvirostridae, Charadriiformes), Kowanyama, 27.x.1966, R. D. and R. H. W. (2 ♀ ♀).

Strandtmann (1951, 1959) has figured two forms of this species. The original series from *H. mexicanus* (Müller) shows the margin of the podonotal shield behind the level of the stigmata almost *rounded*, but with indications of three shallowly convex lobes. The second form, from *Charadrius vociferus* Linnaeus, shows the same bell-shaped shield, but with the posterolateral corners *angulate* and the medial curve less pronounced.

Fain and Johnston (1966) also figured a specimen from *C. vociferus*, but show the posterolateral margin somewhat *eroded*.

The present series from *H. leucocephalus* shows the rounded, and the specimens recorded by Domrow (1966*b*) from *Lobibyx miles* and *L. novaehollandiae* the angulate form. However, I can now refer the specimens from *Erythrogonys cinctus* and *C. melanops* to the eroded, and not to the original rounded form merely because they were non-angulate (Domrow, 1966*b*). I therefore accept all these specimens as falling within the range of individual variation of a single species.

RHINONYSSUS SPHENISCI Fain and Mortelmans

Rhinonyssus spenisci Fain and Mortelmans, 1959, *Bull. Soc. r. Zool. Anvers*, 12: 13. *Rhinonyssus sphenisci schelli* Fain and Hyland, 1963, *Bull. Soc. r. Zool. Anvers*, 32: 4. New synonymy. *Rhinonyssus schelli*, Wilson, 1967, *Antarctic Res. Ser.*, 10: 41.

Previous record.—Adélie penguin (vagrant), *Pygoscelis adeliae* (Hombron and Jacquinot) (Spheniscidae, Sphenisciformes).

The synonymy is obvious from the descriptions, and both records are

RHINONYSSUS MINUTUS (Bregetova)

Sternostomum minutus Bregetova, 1950, *Dokl. Akad Nauk SSSR*, 71: 1007. *Sternostoma minutus*, Furman, 1957, *Hilgardia*, 26: 483. *Rhinonyssus minutus*, Fain, 1961, *Acarologia*, 3: 514; Domrow, 1965, *Acarologia*, 7: 450. *Rhinonyssus pluvialis* Fain and Johnston, 1966, *Bull. Soc. r. Zool. Anvers*, 38: 27. New synonymy.

Previous records (all Charadriidae, Charadriiformes).—Eastern golden plover, *Pluvialis dominicus* (Müller). Red-capped dotterel, *Charadrius alexandrinus* Linnaeus, Half Tide. Also Tin Can Bay and estuary of Topsy Ck. Ringed plover (vagrant), *C. hiaticula* Linnaeus.

The synonymy is obvious from the descriptions, and all hosts are charadriiforms.

RHINONYSSUS CONIVENTRIS Trouessart

(Figs 48–57)

Rhinonyssus coniventris Trouessart, 1894, *C. r. Séanc. Soc. Biol.*, (10) 1: 724; Hirst, 1921, *Proc. zool. Soc. Lond.*, 1921: 361; Strandtmann, 1951, *J. Parasit.*, 37: 130; 1956, *Proc. ent. Soc. Wash.*, 58: 130; Mitchell, 1961, *SWest. Nat.*, 6: 103; Fain, 1963, *Bull. Annls Soc. r. ent. Belg.*, 99: 88; Domrow, 1965, *Acarologia*, 7: 450. *Rhinonyssus echinipes* Hirst, 1921, *Proc. zool. Soc. Lond.*, 1921: 359. *Rhinonyssus neglectus* Hirst, 1921, *Proc. zool. Soc. Lond.*, 1921: 359; Bregetova, 1951, *Parazit. Sb.*, 13: 117. *Rhinonyssus tringae* Fain, 1963, *Bull. Annls Soc. r. ent. Belg.*, 99: 96. *Rhinonyssus* sp. Domrow. 1967, PROC. LINN. SOC. N.S.W., 91: 216.

Previous records (all Charadriiformes).—Turnstone, *Arenaria interpres* (Linnaeus) (Charadriidae). Grey plover, *Squatarola squatarola* (Linnaeus) (Charadriidae). Eastern golden plover, *Pluvialis dominicus* (Müller) (Charadriidae). Red-capped dotterel, *Charadrius alexandrinus* Linnaeus, Half Tide. Also Tin Can Bay. Ringed plover (vagrant), *Charadrius hiaticula* Linnaeus. Wood-sandpiper, *Tringa glareola* Linnaeus (Scolopacidae). Sanderling, *Crocethia alba* (Vroeg) Scolopacidae). Dunlin (vagrant), *Erolia alpina* (Linnaeus) (Scolopacidae). Knot, *Calidris canutus* (Linnaeus) (Scolopacidae).

New host record.—Red-necked stint, *Erolia ruficollis* (Pallas) (Scolopacidae), estuary of Topsy Ck., 29.x.1966, R. D. (1♀).

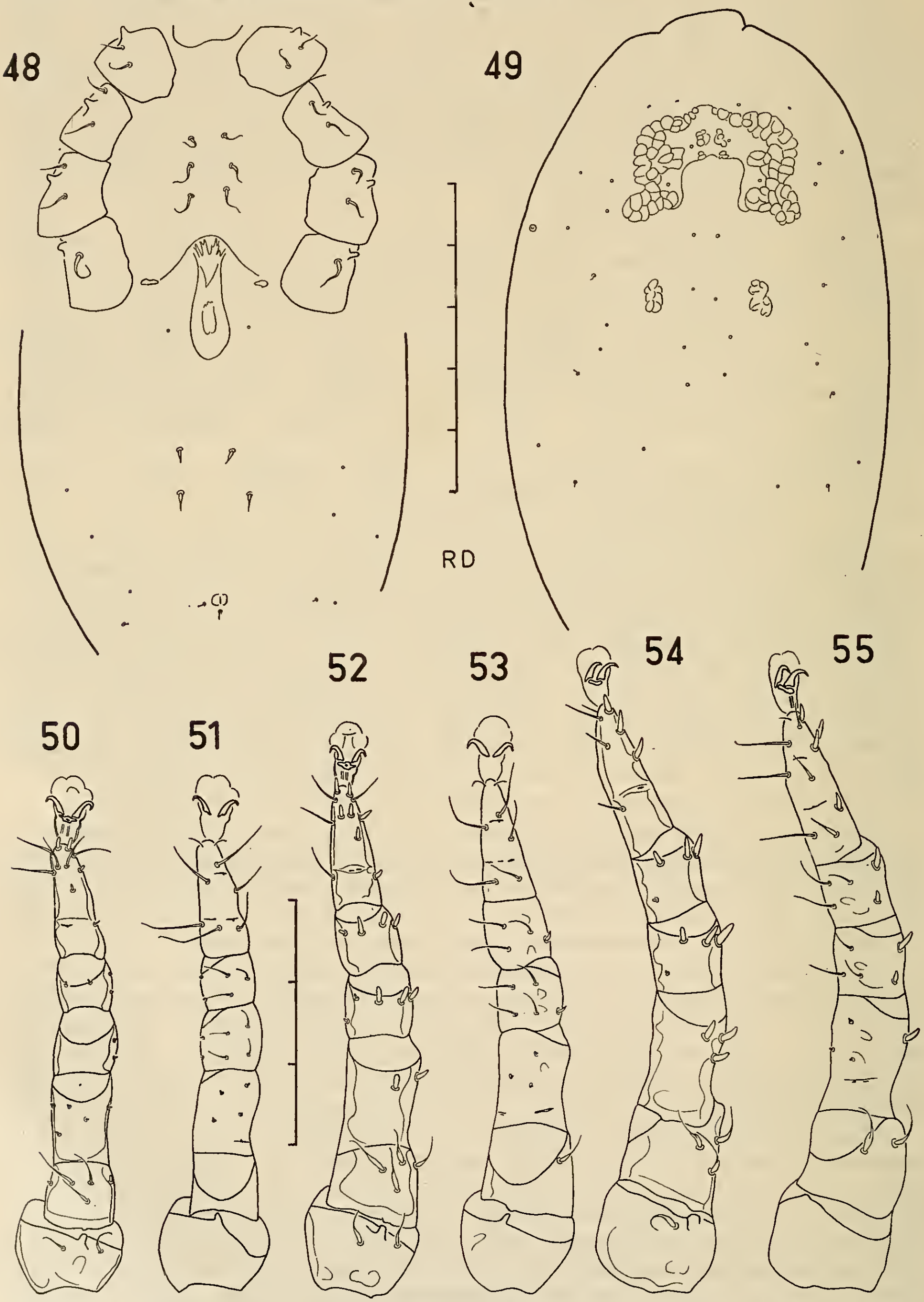
Two considerations underline the artificiality of distinguishing, even as subspecies, the three nominal taxa of Trouessart and Hirst, whose hosts include a range of charadriiform birds. On a morphological level, Strandtmann (1951), studying material from Trouessart's type-host, *A. interpres,* figured a female with a *coniventris*-like, and a male with a *neglectus*-like podonotal shield. Indeed, the degree of erosion of the podonotal shield shows clinal variation in the direction *R. echinipes*—*R. coniventris*—*R. neglectus,* but a convincingly identical pattern of muscle insertions is retained in all three. Further, Fain (1963*a*), in an *addendum,* records specimens from the same host, which bridge another morphological gap (setation of femur IV) in the first couplet of his key attempting to separate the three forms.

On an ecological level, Fain (1963*a*) lists *R. c. echinipes* from *Charadrius alexandrinus* in Europe, and suggests this form is host-specific for *Charadrius* Linnaeus. However, in Queensland, two further series (3♀♀ and 1♂, Tin Can Bay, 29.vi and 17.viii.1966, R. D. and J. S. W.) confirm my earlier record (1965*c*) of a *neglectus*-like form from *C. alexandrinus.*

The female from *E. ruficollis* recalls *R. tringae* in the shape of its podonotal shield, but perhaps even here the same pattern of muscle insertions noted above can be made out (Fig. 56), and I therefore maintain the synonymy. (A paratype of *R. tringae* agrees well with Fain's illustration, but shows a distinct setal remnant towards the rear of each arm of the podonotal shield.)

The new Queensland specimen is illustrated in detail (Figs 48–57) because its setation (*e.g.* on the sternal shield and tarsus IV) differs somewhat from that of Fain's material. Apart from tarsus I, which is identical ventrally with Fain's Fig. 10, leg I is similar to leg II, except that (*i*) only two filamentous setae are present on the trochanter; (*ii*) seven minute setae are present ventrally on the femur; and (*iii*) two additional minute setae are present on the ventrodistal margin of the genu. The setal formulae, therefore, are: coxae 2.2.2.1; trochanters 4.5.5.5; femora 11.10/9.5.7; genua 10.8.10.9; tibiae 9.9.8.9; tarsi–.18.18.18 (*mv* present).

A species such as *R. coniventris,* morphologically much reduced and with a world-wide distribution throughout a group of birds as extensive as the Charadrii, may be expected to show a wider range of individual variation than a more zoogeographically restricted species.



Figs 48–55. *Rhinonyssus coniventris* Trouessart (♀ from *Erolia ruficollis*).–48–49, Ventral and dorsal views of idiosoma. 50–55, Ventral and dorsal views of legs II–IV.

Genus RUANDANYSSUS Fain

Ruandanyssus Fain, 1957, *Annls Parasit. hum. comp.*, 32: 148. Type-species *Ruandanyssus terpsiphonei* Fain, 1957, *Loc. cit.*, 148.

Key to females of Australian species of RUANDANYSSUS

1. Opisthonotal shield considerably narrower than podonotal shield, and tapering posteriorly. Most idiosomal setae reaching at least half way to the base of the next nearest seta. Tritosternum with fully formed laciniae........ ....*terpsiphonei* Fain

Opisthonotal shield almost as wide as podonotal shield, and somewhat truncate posteriorly. Most idiosomal setae falling far short of the base of the next nearest seta. Tritosternal laciniae obsolescent .... *artami*, n. sp

RUANDANYSSUS TERPSIPHONEI Fain

(Figs 58–68)

Ruandanyssus terpsiphonei Fain, 1957, *Annls Parasit. hum. comp.*, 32: 148; 1960, *Revue Zool. Bot. afr.*, 62: 98; Domrow, 1965, *Acarologia*, 7: 432. *Ruandanyssus terpsiphonei terpsiphonei*, Sakakibara, 1968, *J. med. Ent.*, 5: 17. *Ruandanyssus terpsiphonei echongi* Sakakibara, 1968, *J. med. Ent.*, 5: 15. New synonymy.

Previous records (all Passeriformes).—Spectacled flycatcher, *Monarcha trivirgata* (Temminck) (Muscicapidae), Mt. Jukes. Also Innisfail. Black-faced cuckoo-shrike, *Coracina novaehollandiae* (Gmelin) (Campophagidae), Esk. Little cuckoo-shrike, *C. robusta* (Latham), Esk. Rufous whistler, *Pachycephala rufiventris* (Latham) (Pachycephalidae), Esk and Mt. Jukes. Apostle-bird, *Struthidea cinerea* Gould (Corvidae), Condamine.

New host records (all Passeriformes).—Leaden flycatcher, *Myiagra rubecula* (Latham) (Muscicapidae), Brisbane, 15.ix.1965, Esk, 13.ii.1968, and Innisfail, 3.viii.1965, R. D., B. H. K., and J. S. W. (16 ♀ ♀, 4 ♂ ♂, and 1 protonymph). White-winged triller, *Lalage tricolor* (Swainson) (Campophagidae), Kowanyama, 25.x.1966, R. D. (2 ♀ ♀, 1 ♂). White-browed scrub-wren, *Sericornis frontalis* (Vigors and Horsfield) (Sylviidae), Esk, 6.x.1966, R. D. and J. S. W. (13 ♀ ♀, 1 ♂). Masked wood-swallow, *Artamus personatus* (Gould) (Artamidae), Charleville, 24.i.1967, R. D. and J. S. W. (1 ♀). Golden whistler, *Pachycephala pectoralis* (Latham) (Pachycephalidae), Esk, 14.vii.1965, R. D. and J. S. W. (15 ♀ ♀, 4 ♂ ♂, 1 protonymph). Grey whistler, *P. griseiceps* Gray, Innisfail, 8.vii, and 1 and 10.ix.1965, G. J. B. and H. I. McD. (36 ♀ ♀, 5 ♂ ♂, 1 proto-, and 1 deutonymph).

As presaged by the absence of one genital seta, the female I illustrated (1965*c*) is confirmed as an extreme individual variant lacking both metasternal setae. On checking a long series of both sexes, both metasternals were invariably found present (as originally figured for the male), except in one specimen, where one is lacking (Figs 67–68).

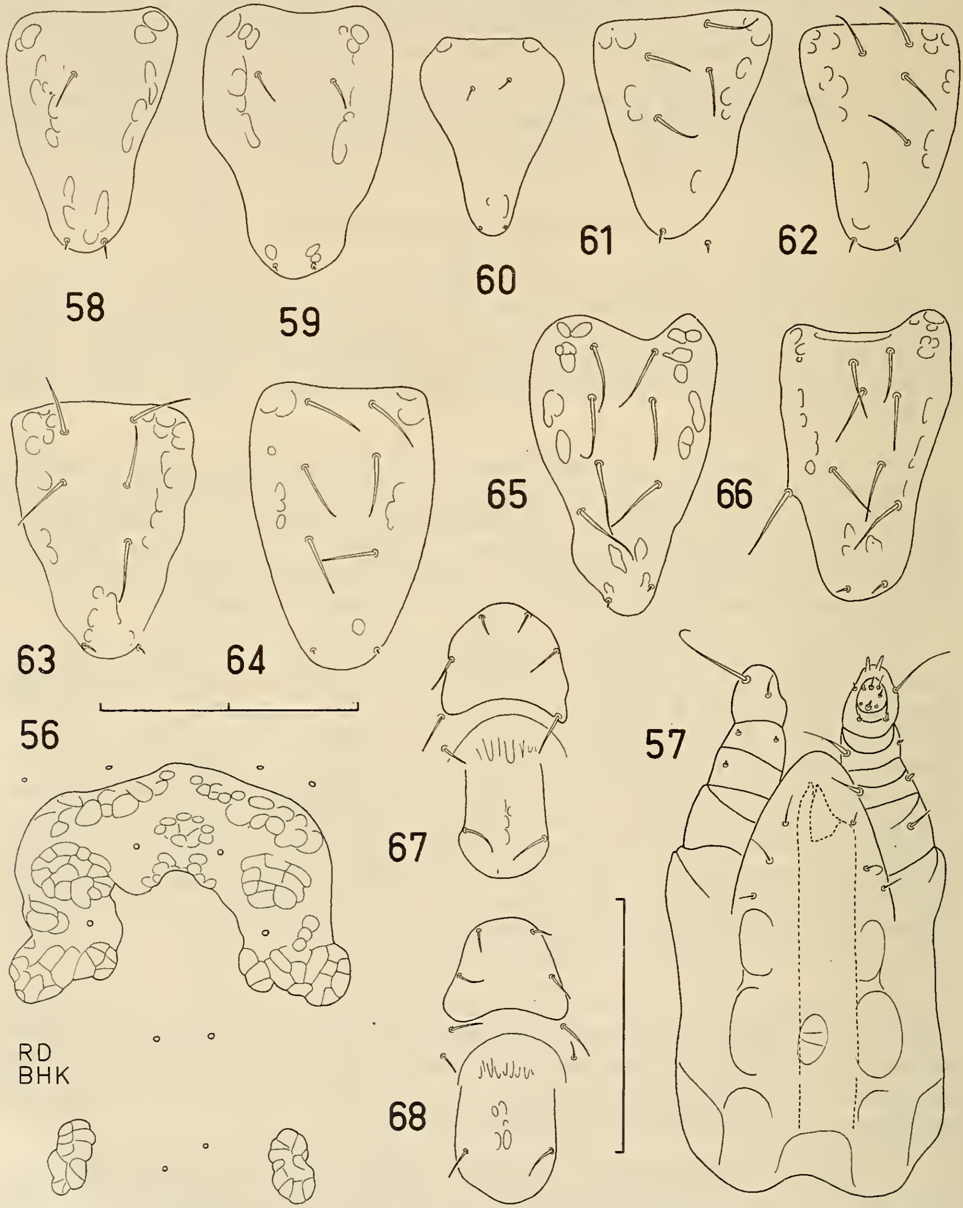
Further, an examination of 75 specimens yielded no aberrancies from the 1.1 discal setae figured by Fain and myself on the opisthonotal shield except 1.0 three times (Figs 58–60). However, the material from *Myiagra rubecula* differs in showing additional longitudinally arranged pairs of discal setae on the opisthonotal shield. The following formulae were noted: 1.3 once, 2.2 once, 2.3 four times, 3.3 nine times, 3.4 three times, and 4.4 once (Figs 61–66). I do not feel these minor varieties merit a name.

Ruandanyssus artami, n. sp.

(Figs 69–74, 161–164)

Ruandanyssus sp. Domrow, 1967, Proc. Linn. Soc. N.S.W., 91: 217.

Diagnosis.—*R. artami* is readily separable from the preceding, and only other known species, *R. terpsiphonei* Fain (1957*a*), by using the key above.



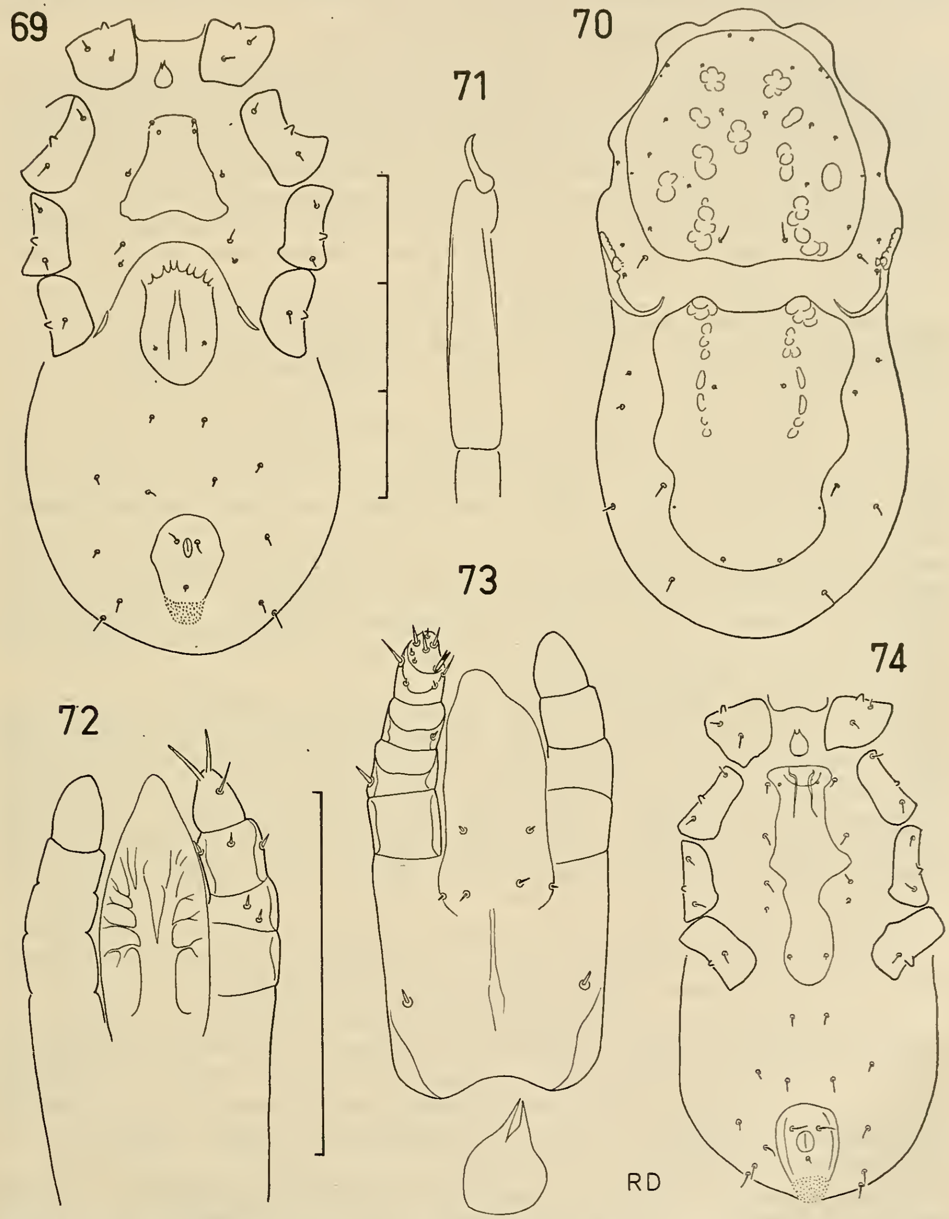
Figs 56–57. *Rhinonyssus coniventris* Trouessart (♀ from *Erolia ruficollis*).–56, Podonotal shield and mesonotal shieldlets. 57, Ventral view of capitulum (right palp in dorsal view).

Figs 58–68. *Ruandanyssus terpsiphonei* Fain.–58, Opisthonotal shield of ♂ from *Monarcha trivirgata*. 59–60, Opisthonotal shield of ♀♀ from *Pachycephala rufiventris* and *Sericornis frontalis*. 61–62, Opisthonotal shield of ♂♂ from *Myiagra rubecula*. 63–66, Opisthonotal shield of ♀♀ from *M. rubecula*. 67–68, Sternal and genital shields of ♀♀ from *P. griseiceps*.

Types.—Holotype female, allotype male, and two paratype females from black-faced wood-swallows, *Artamus cinereus* Gould (Artamidae, Passeriformes), Kowanyama, 27.iii and 1.iv.1965, R. D. and J. S. W. Holotype and allotype N. I. C.; paratypes R. D and A. F.

Also 3 ♀ ♀, 1 ♂, and 2 protonymphs from a little wood-swallow, *A. minor* Vieillot, Charleville, 23.i.1967, R. D. and J. S. W.

Female.—Idiosoma 585–595μ long in little compressed specimens (one containing embryonic larva, another with undeveloped ovum extruded),



Figs 69–74. *Ruandanyssus artami,* n. sp. (from *Artamus cinereus*).–69–70, Ventral and dorsal views of idiosoma of ♀. 71, Chelicera of ♀. 72–73, Dorsal and ventral views of capitulum of ♀. 74, Ventral view of idiosoma of ♂.

slightly constricted behind stigmata. Podonotal shield (Fig. 70) as long as wide, rather evenly rounded anteriorly and laterally, but with posterior margin weakly trilobate; with nine pairs of setae (only midposterior pair prominent), and two pairs of submarginal pores. Opisthonotal shield concave anteriorly, roundly convex posteriorly, and trilobate laterally; with one pair of small setae discally in addition to terminal pygidial pair. Both shields closely granulate (except for narrow marginal strip), and further marked by paired muscle insertions. Dorsal cuticle with nine pairs of setae of varying size. Stigmata provided with short peritremes and followed by lateroventrally-directed poststigmatic shields.

Sternal shield (Fig. 69) subtriangular, well sclerotized, granulate, but with indefinite margins; bearing SI (with attendant pores) and flanked by SII–III; metasternal setae present, but small. Genital shield drop-shaped, weakly granulate, with some longitudinal strengthening discally, and rounded, rayed operculum; genital setae small. Anal shield longer than wide, well rounded at front, and denser at sides; cribrum present. Anus set well forward, with adanal setae near its anterior edge; postanal seta smaller, set well back from anus. Ventral cuticle with twelve setae arranged 2.4.6. All body setae simple, with rather blunt tips.

Leg setae similar (Figs 163–164). Coxae 2.2.2.1. Trochanter I (1–0/2–1), II (1–1/2–1), III–IV (1–0/2–1). Femur I (2–3/1–2), II (1–4/2–1), III (1–4/1–0), IV (1–4/0–0). Genu I (1–4/1–1), II–III (1–4/0–1), IV (1–3/0–0). Tibia I (1–4/2–1), II–IV (1–3/2–1). Tarsi – .17.17.16 (*mv* lacking on II–IV; ad_2 also lacking on IV). Minor variants common on femora (I with 1 *pl*, II with 1 *v* or 0 *pl*, III with 0 *v*, IV with 3 *d*), and tarsi (III lacking al_2 or av_2, IV lacking al_2 or al_3). Tarsus I with 21 setae in addition to dorsodistal sensory islet of five rods (Figs 161–162). Two lyriform fissures present, one dorsally and one posterolaterally (I) or anterolaterally (II–IV), between basi- and telofemora. Tarsi II–IV with four lyriform fissures, one dorsobasally on basitarsus, one middorsally on telotarsus, and one dorsally (divided) and one ventrally between basi- and telotarsus. Tarsus I with two fissures only (first and last of above four). Ambulacrum I similar to II–IV, but pretarsus slightly stouter.

Basis capituli (Figs 72–73) with indication of deutosternum, but without denticles; with two capitular setae. All six hypostomal setae present, but small. Epistome hyaline marginally, with denser dendritic area discally. Palpi with usual five free segments; setal formula 0.3.4.7. Genu with dorsobasal lyriform fissure. Tarsus obscured dorsally by tibia; with about six small setae. Claw bifid. Cheliceral shaft of uniform diameter; single (movable) digit falcate, occupying one-sixth of total length (Fig. 71). Tritosternum hyaline, with base well developed, but laciniae obsolescent.

Male.—Idiosoma 485μ long in slightly compressed specimen. Essentially as in female except for fusion of sternal, metasternal, and genital complexes (Fig. 74), and presence of spermatodactyl on chelicerae.

Protonymph.—Podonotal shield as in female, but with only eight pairs of setae (verticals lacking). Pygidial shield indistinct, but with two barbulate setae twice as strong as strongest of simple dorsal setae. Setal arrangement on dorsal cuticle as in female, but including pair of setae taken in discally by expansion of pygidial shield into opisthonotal shield. Stigmata with peritremes, but unarmed.

Sternal shield with two pores near SI; SI–III submarginal. Anal shield as in female. Ventral cuticle with eight setae arranged 2.4.2.

Chaetotaxy of coxae, genua, tibiae, and tarsi as in adult (minute ventrodistal setae on plantar surface of tarsus I difficult to see even at ×500), with following individual variation: coxa III lacking *pv* once, and genu IV (1–2/0–0) twice. Trochanters as in adult, except IV (1–0/2–0), with following individual variations: II (1–0/2–1) once, and III (1–0/2–0) once. Femur I as in adult, II (1–4/1–0), III (1–3/1–0), IV (1–3/0–0), with following individual variation: II (1–4/1–1) once. Lyriform fissures arranged as in adult, but dorsobasal fissure on basitarsus I absent, and dorsal fissure between basi- and telotarsi II–IV undivided.

Capitulum as in female, but with five deutosternal denticles in single file.

Genus RHINOECIUS Cooreman

Rhinoecius Cooreman, 1946, *Bull. Mus. r. Hist. nat. Belg.*, 22: 1. Type-species *Rhinoecius oti* Cooreman, 1946, *Loc. cit.*, 1. *Zumptnyssus* Fain, 1959, *Bull. Annls Soc. r. ent. Belg.*, 95: 112. Type-species *Ruandanyssus buboensis* Fain, 1958, *Revue Zool. Bot. afr.*, 58: 292. New synonymy.

The presence or absence of a tritosternum, as indicated under *Tinaminyssus* above, and *Ptilonyssus* below, has no meaning at a generic level. Further, both genera are restricted to owls.

Key to females of Australian species of RHINOECIUS

1. Podonotal shield entire .... *cooremani* Strandtmann
Podonotal shield fragmentary, with one larger anterior, and four smaller posterior fragments .... *tytonis* Fain

RHINOECIUS COOREMANI Strandtmann
(Figs 75–77)

Rhinoecius cooremani Strandtmann, 1952, *Proc. ent. Soc. Wash.*, 54: 208.

This genus, previously recorded only from strigid owls in Europe, Africa, and the U.S.A., may now be added to the Australian fauna: 9 ♀ ♀ and 1 protonymph from a boobook owl, *Ninox novaeseelandiae* (Gmelin) (Strigidae, Strigiformes), Esk, 5.i.1966, R. D. and J.S.W.

I have examined paratypes of Strandtmann's three species (two of which have been further illustrated by do Amaral, 1962), and my specimens differ from his *R. cooremani* only in showing (*i*) the anteriormost pair of dorsal cuticular setae apparently set on the margin of the podonotal shield (Fig. 77) (I say "apparently" because the cuticle on the specimens available is somewhat exfoliated, and could have come, together with its setae, to lie over the edge of the shield); and (*ii*) the postanal seta present, but rather weaker than the adanals (Figs 76–77). The capitulum is depicted in Fig. 75.

RHINOECIUS TYTONIS Fain

Rhinoecius tytonis Fain, 1956, *Revue Zool. Bot. afr.*, 53: 394; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 131, 138.

Previous record.—Barn-owl, *Tyto alba* (Scopoli) (Tytonidae, Strigiformes).

Genus PTILONYSSUS Berlese and Trouessart

Ptilonyssus Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest*, 2: 128. Type-species *Ptilonyssus echinatus* Berlese and Trouessart, 1889, *Loc. cit.*, 129. *Rhinonyssoides* Hirst, 1921, *Proc. zool. Soc. Lond.*, 1921: 770. Type-species *Rhinonyssoides trouessarti* Hirst, 1921, *Loc. cit.*, 770. *Neonyssus* Hirst, 1921, *Proc. Zool. Soc. Lond.*, 1921: 771. Type-species *Neonyssus intermedius* Hirst, 1921, *Loc. cit.*, 771. *Neonyssoides* Hirst, 1923, *Proc. zool.*

Soc. Lond., 1923: 975. Type-species *Rhinonyssus* (*Neonyssoides*) *nucifragae* Hirst, 1923, *Loc. cit.*, 975. Hirst's three type-species have since been described and illustrated by Fain (1960*a*), Fain and Hyland (1962*b*), and Bregetova (1967). *Ptilonyssoides* Vitzthum, 1935, *J. Orn., Lpz.*, 83: 581. Type-species *Ptilonyssoides triscutatus* Vitzthum, 1935, *Loc. cit.*, 581. *Rhinacarus* de Castro, 1948, *Archos Inst. biol., S Paulo*, 18: 257, *nec* Nehring, 1884, *Sber. Ges.*

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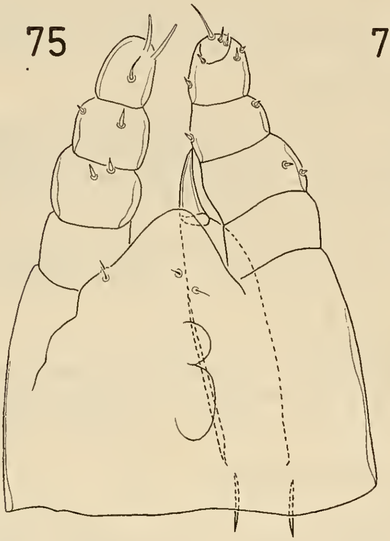

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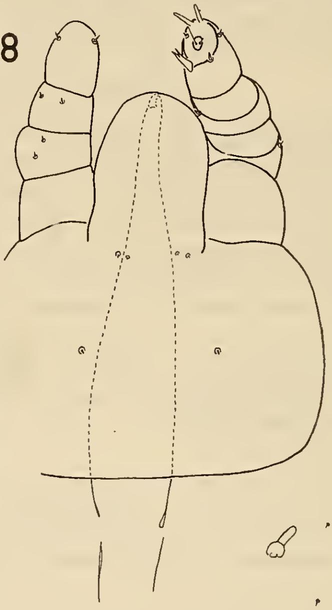

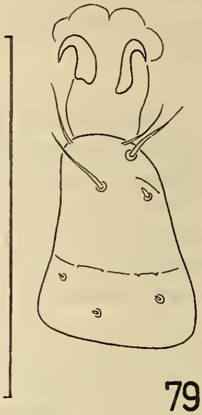

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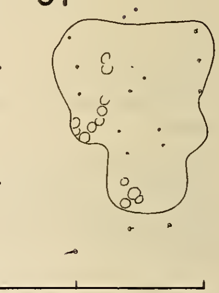

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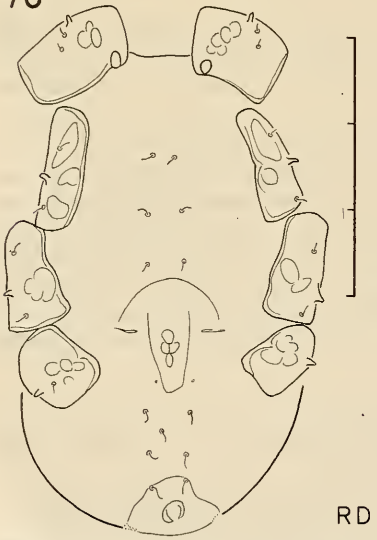

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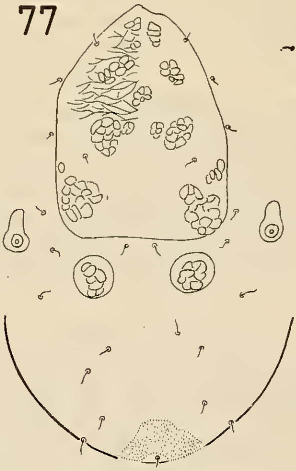

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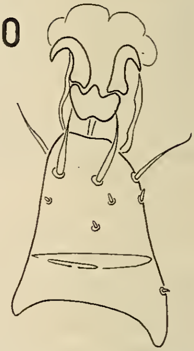

Figs 75–77. *Rhinoecius cooremani* Strandtmann (♀ from *Ninox novaeseelandiae*).–75, Ventral view of capitulum (right palp in dorsal view). 76–77, Ventral and dorsal views of idiosoma.

Figs 78–80. *Ptilonyssus neochmiae*, n. sp. (♀ from *Neochmia phaeton*).–78, Ventral view of capitulum (right palp in dorsal view). 79–80, Dorsal and ventral views of tarsus III.

Fig. 81. *Ptilonyssus cinnyris* Zumpt and Till (♀ from *Cyrtostomus frenatus*).–Opisthonotal shield.

naturf. Freunde Berl., 1884: 64. Type-species *Rhinonyssus* (*Rhinacarus*) *angrensis* de Castro, 1948, *Loc. cit.*, 257. New synonymy. The relevant paragraph of Nehring runs: "*Der Name* Halarachne *erscheint mir nicht sehr glücklich gewählt, da diese Milbe nach den bisherigen Beobachtungen keineswegs frei im Meerwasser lebt, sondern ihre Existenz an die Nasenhöhle der Kegelrobben (vielleicht auch anderer Pinnipedier) bindet und sich vermuthlich nur von Thier zu Thier überträgt. Ich würde sie* Rhinixodes *oder* Rhinacarus *nennen, wenn sie neu zu benennen wäre.*" Nehring's use of the subjunctive indicates that he did not mean to erect these names for possible use in the future, but that he was only indicating what names he himself might have used had he been naming the taxon. Indeed, he did not even show a preference for either name, and it could be argued that the names were not proposed for taxonomic use (Art. 1). On the other hand, assuming these names were proposed for taxonomic use, they can only be considered as synonyms of *Halarachne* Allman, as did Nehring himself, since he continued to use *Halarachne*. Thus, as names first published as synonyms, they are unavailable under Art. 11.

Flavionyssus de Castro, 1948, *Archos Inst. biol., S Paulo,* 18: 266. Type-species *Ptilonyssus* (*Flavionyssus*) *rabelloi* de Castro, 1948, *Loc. cit.*, 266. *Rochanyssus* de Castro, 1948, *Archos Inst. biol., S Paulo,* 18: 272. Type-species *Neonyssus* (*Rochanyssus*) *werneri* de Castro, 1948, *Loc. cit.*, 272. *Paraneonyssus* de Castro, 1948, *Archos Inst. biol., S Paulo,* 18: 274. Type-species *Neonyssus* (*Paraneonyssus*) *enriettii* de Castro, 1948, *Loc. cit.*, 274. *Travanyssus* de Castro, 1948, *Archos Inst. biol., S Paulo,* 18: 276. Type-species *Neonyssus* (*Travanyssus*) *paranensis* de Castro, 1948, *Loc. cit.*, 276. *Vitznyssus* de Castro, 1948, *Archos Insi. biol., S Paulo,* 18: 277. Type-species *Dermanyssus nitzschi* Giebel, 1871, *Z. ges. Naturw.*, 38: 31. New synonymy. *Cas* Baker and Wharton, 1952, "An introduction to acarology" (Macmillan: New York), p. 81 (unnecessary *nomen novum* for *Rhinacarus* de Castro). Type-species as for *Rhinacarus* de Castro, *v. supra*. New synonymy. *Astridiella* Fain, 1957, *Riv. Parassit.*, 18: 94. Type-species *Ptilonyssus scotornis* Fain, 1956, *Revue Zool. Bot. afr.*, 53: 148. New synonymy. *Hapalognatha* Butenko, 1959, *Nauch. Dokl. vÿssh. Shk.*, 2: 17; 1960, *Zool. Zh.*, 39: 1490. Type-species *Hapalognatha prima* Butenko, 1959, *Loc. cit.*, 17 (*nomen nudum* under Art. 13); 1960, *Loc. cit.*, 1490. *Passeronyssus* Fain, 1960, *Revue Zool. Bot. afr.*, 61: 110; 1962, *Ibid.*, 66: 139; Fain and Nadchatram, 1962, *Bull. Annls Soc. r. ent. Belge.*, 98: 275. Type-species *Ptilonyssus viduae* Fain, 1956, *Revue Zool. Bot. afr.*, 53: 147; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 120. New synonymy. *Tyranninyssus* Brooks and Strandtmann, 1960, *J. Parasit.*, 46: 418. Type-species *Tyranninyssus tyrannus* Brooks and Strandtmann, 1960, *Loc. cit.*, 419. New synonymy. *Locustellonyssus* Bregetova, 1964, "Some problems of evolution of the rhinonyssid mites" (Nauka: Leningrad). *Locustellonyssus* is not mentioned in the text of this article, but occurs in an accompanying photograph of a table on host-specificity. This does not constitute publication under Art. 8; and, in any case, as no type-species is given, *Locustellonyssus* is unavailable here under Art. 13. Also 1965, *Zool. Zh.*, 44: 1093. Type-species *Locustellonyssus amurensis* Bregetova, 1965, *Loc. cit.*, 1093. New synonymy. *Periglischrodes* Baker and Delfinado, 1964, *Pacif. Insects*, 6: 589. Type-species *Periglischrodes gressitti* Baker and Delfinado, 1964, *Loc. cit.*, 589. *Otocorinyssus* Bregetova, 1967, *Parazit. Sb.*, 23: 127. Type-species *Neonyssus* (*Otocorinyssus*) *melanocoryphae* Bregetova, 1967, *Loc. cit.*, 127. New synonymy. *Frigilonyssus* Bregetova, 1967, *Parazit. Sb.*, 23: 130. Type-species *Ptilonyssus coccothraustis* Fain and Bafort, 1963, *Bull. Annls Soc. r. ent. Belg.*, 99: 447. New synonymy. *Spizonyssus* Bregetova, 1967, *Parazit. Sb.*, 23: 131. Type-species *Ptilonyssus serini* Fain, 1956, *Revue Zool. Bot. afr.*, 53: 139; 1957, *Annls Mus. r. Congo* *belge Sér. 8vo,* 60: 90. New synonymy. *Neotyranninyssus* Fain and Aitken, 1967, *Bull. Inst. r. Sci. nat. Belg.,* 43: 27. Type-species *Neotyranninyssus fluvicolae* Fain and Aitken, 1967, *Loc. cit.,* 29. New synonymy. *Trochilonyssus* Fain and Aitken, 1967, *Bull. Inst. r. Sci. nat. Belg.,* 43: 29. Type-species *Trochilonyssus trinitatis* Fain and Aitken, 1967, *Loc. cit.,* 32. New synonymy. *Pipronyssus* Fain and Aitken, 1967, *Bull. Inst. r. Sci. nat. Belg.,* 43: 36. Type-species *Pipronyssus manaci* Fain and Aitken, *Loc. cit.,* 36. New synonymy.

The number of synonyms for *Ptilonyssus s. l.* is already large, but I make no apology for increasing it further. The reason that the boundaries between these taxa have been drawn, and redrawn, is the simple one that they correspond to nothing at all, their only purpose having been to divide, in the light of arbitrary and trivial morphological characters, a group of which all other considerations emphasize the fundamental unity. The smaller the taxon, the greater should be the morphological and ecological gap between it and its nearest relatives.

It has proved difficult to arrange this large series in a completely orderly system, and I have therefore compromised between the order of the key and the order of the hosts. This point is discussed further in Section V below on host-specificity.

Key to females of Australian species of PTILONYSSUS

1. Stigmata provided with peritremes 2

Stigmata not provided with peritremes 49

2 (1). Dorsal armature (excluding mesonotal shieldlets) comprising three units: podonotal, opisthonotal, and pygidial, of which the latter two may, or may not be fused 3

Dorsal armature (excluding mesonotal shieldlets) comprising two units: podonotal and pygidial, of which the latter may be obsolescent or absent 14

3 (2). Mesonotal sclerotization with two pairs of strong, peg-like setae in tandem. Postanal seta absent .... *ailuroedi* Domrow

Mesonotal complex otherwise. Postanal seta normally present, but absent in *P. pygmaeus* (Bregetova) 4

4 (3). Cribrum present 5

Cribrum absent 13

5 (4). Pygidial shield fused with opisthonotal shield 6

Pygidial shield free 12

6 (5). Metasternal setae normally present, but absent in specimens of *P. carduelis* Fain from *Chloris chloris* (Linnaeus) 7

Metasternal setae absent 11

7 (6). Podonotal shield with four setae considerably stronger than remainder on dorsum .... *carduelis* Fain

All setae on dorsum uniform in size 8

8 (7). Podonotal shield strongly convex laterally 9

Podonotal shield parallel-sided .... *maluri* Domrow

9 (8). Opisthonotal shield widest anteriorly. Adanal setae near front of anus. Coxal setae uniform in length 10

Opisthonotal shield widest at its middle. Adanal setae near back of anus. Seta on coxa IV elongate .... *hirsti* (de Castro and Pereira)

10 (9). Postanal seta present .... *emberizae* Fain

Postanal setae absent .... *pygmaeus* (Bregetova), n. comb.

11 (6). Opisthonotal shield subtriangular, with four pairs of setae in addition to pygidials. Tarsi II-IV with al_1, av_1, pv_1, al_2, av_2, and pv_2 in form of strong, slightly curved spurs, which, at their apex, curve distinctly while tapering rapidly .... *colluricinclae* Domrow

Opisthonotal shield subrectangular, with one pair of setae in addition to pygidials. Tarsi II-IV with al_1, av_1, pv_1, and pl_1 irregularly inflated.... ....*capitatus* (Strandtmann)

12 (5). Opisthonotal shield fully as wide as podontal, and considerably larger than pygidial shield. Anus occupying entire anterior angle of elongate anal shield, preceding all three anal setae .... *triscutatus* (Vitzthum)

Opisthonotal shield much narrower than podonotal, and subequal to pygidial shield. Anus centrally placed on anal shield, flanked laterally by adanal setae .... *sittae* Fain

13 (4). Opisthonotal shield entire, with pygidial complex obliterated .... *struthideae*, n. sp.

Opisthonotal shield fragmented, with pygidial remnants possibly present.... *corcoracis*, n. sp.

14 (2). Distinct tritosternum with well developed laciniae present .. *nitzschi* (Giebel)

Tritosternum rarely present, and then represented only by merest remnant, without laciniae 15

15 (14). Postanal seta normally present, but absent in specimens of *P. terpsiphonei* Fain from *Carterornis* Mathews and *Monarcha melanopsis* (Vieillot) .. 16

Postanal seta absent 41

16 (15). Podonotal shield not flanked on each side by small accessory shield 17

Podonotal shield flanked on each side by small accessory shield 38

17 (16). Podonotal shield at least as wide as long, with lateral margins concave in their posterior half, and therefore divergent behind the peritrematalia. Posterolateral angles of shield full and rounded, resulting in a wide, shallowly 3-lobed posterior margin 18

Podonotal shield normally clearly longer than wide, but if not, not formed as above 20

18 (17). Podonotal shield not sufficiently reduced posteriorly to leave midposterior pair of setae free in cuticle immediately in front of mesonotal shieldlets .... *cractici* Domrow

Podonotal shield with posterior margin sufficiently eroded medially to leave midposterior pair of setae free in cuticle 19

19 (18). Pygidial shield present, either entire or divided .... *motacillae* Fain

Pygidial shield absent .... *langei* (Butenko), n. comb.

20 (17). Podonotal shield not sufficiently reduced posteriorly to leave midposterior pair of setae free in cuticle immediately in front of mesonotal shieldlets 21

Podonotal shield truncate posteriorly, leaving midposterior pair of setae free in cuticle immediately in front of mesonotal shieldlets 31

21 (20). Two setae on posterior margin of podonotal shield subequal to remainder on shield 22

Two setae on posterior margin of podonotal shield considerably stronger than remainder on shield 30

22 (21). Pygidial shield normally entire, but divided in specimens of *P. philemoni* from *Meliphaga notata* (Gould) and *M. gracilis* (Gould) 23

Pygidial shield divided or absent 29

23 (22). Palpal setae not as long as their corresponding segment. Ventral surface of opisthosoma with 6-14 pairs of setae 24

Four setae on ventrolateral aspect of each palp considerably longer than their corresponding segments. Ventral surface of opisthosoma with about 28 pairs of setae .... *balimoensis* Sakakibara

24 (23). All coxal setae normally sharply tipped, but blunt and peg-like on coxa I of *P. terpsiphonei* Fain.......... 25

All coxal setae inflated, subglobular .... *trouessarti* (Hirst)

25 (24). Genital setae on genital shield 26

Genital setae in cuticle adjacent to genital shield .... *philemoni* Domrow

26 (25). All leg setae sharply pointed. Seta *mv* absent on tarsi II-IV 27

Legs with a *mélange* of pointed and blunt, peg-like setae. Seta *mv* present on tarsi II-IV .... *terpsiphonei* Fain

27 (26). Adanal setae in front of anus .... *microecae* Domrow

Adanal setae behind anus 28

28 (27). Podonotal shield larger in posterior half, with posterior margin subrectilinear and bearing four setae. Metasternal setae present. Ventral surface of opisthosoma with about six pairs of setae .. *nudus* Berlese and Trouessart

Podonotal shield larger in anterior half, with posterior margin fully curved and bearing two setae. Metasternal setae absent. Ventral surface of opisthosoma with 8-10 pairs of setae .... *orthonychus*, n. sp.

29 (22). Podonotal shield with seven pairs of setae, of which only four are submarginal. Pygidial shields distinct. Adanal setae in front of anus .... *myzanthae* Domrow

Podonotal shield with six pairs of setae, all submarginal. Pygidial shield obsolescent. Adanal setae behind anus .... *myzomelae* Domrow

30 (21). Adanal setae in front of anus. Pygidial shield entire ...... *acrocephali* Fain

Adanal setae behind anus. Pygidial shield divided .... *pittae* Domrow

31 (20). Pygidial shield entire 32

Pygidial shield divided or absent 36

32 (31). Podonotal shield at least as long as wide 33

Podonotal shield noticeably wider than long 35

33 (32). Podonotal shield convex laterally, with at least six pairs of setae (including vertical pair). Adanal setae in front of anus 34

Podonotal shield concave laterally, with only three pairs of setae (including vertical pair). Adanal setae behind anus .... *stomioperae* Domrow

34 (33). Podonotal shield with two pairs of setae posteriorly .... *setosae*, n. sp.

Podonotal shield with one pair of setae posteriorly ...... *gerygonae*, n. sp.

35 (32). Setae between podonotal shield and peritrematalia undistinguished. Coxa II without anterodorsal process .... *dicaei* Domrow

Two setae between podonotal shield and peritrematalia on each side considerably stronger than remainder. Coxa II with anterodorsal process .... *ruandae* Fain

36 (31). Podonotal shield widest near its middle. Pygidial shields present, even if small 37

Podonotal shield clearly widest anteriorly. Pygidial shields completely absent ....*cinnyris* Zumpt and Till

37 (36). Podonotal shield with three pairs of setae in midline (including verticals). Pygidial shields subcircular, well formed .... *rhipidurae* Domrow

Podonotal shield with four pairs of setae in midline. Pygidial shields evanescent .... *lymozemae* Domrow

38 (16). Coxal setae inflated, subspherical .... *echinatus* Berlese and Trouessart

Coxal setae elongate, slenderly tapering 39

39 (38). Adanal setae behind anus 40

Adanal setae in front of anus .... *thymanzae* Domrow

40 (39). Podonotal shield distinctly broader in anterior half, with six pairs of setae .... *gliciphilae* Domrow

Podonotal shield narrowly subrectangular, with four pairs of setae (including vertical pair) .... *meliphagae* Domrow

41 (15). Pygidial shield entire 42

Pygidial shield absent .... *cerchneis* Fain

42 (41). Podonotal shield* not sufficiently reduced posteriorly to leave midposterior pair of setae free in cuticle immediately in front of mesonotal shieldlets 43

Podonotal shield truncate posteriorly, leaving midposterior pair of setae free in cuticle immediately in front of mesonotal shieldlets 47

43 (42). Setae on coxae and venter of opisthosoma slenderly tapering 44

Setae on coxae and venter of opisthosoma truncate, rod-like 46

44 (43). Coxa II without anterodorsal process 45

Coxa II with anterodorsal process .... *monarchae*, n. sp.

45 (44). A stout species when engorged. Podonotal shield strongly cordate, with regular margins .... *sphecotheris* Domrow

An elongate species when engorged. Podonotal shield with lateral margins very irregular, and noticeably narrower in posterior third .... *sturnopastoris* Fain

46 (43). Chelicerae attenuate only at extreme tip .... *novaeguineae* (Hirst)

Chelicerae attenuate in distal half .... *grallinae* Domrow

47 (42). Chelicerae attenuate only at extreme tip .... *novaeguineae* (Hirst)

Chelicerae attenuate in distal half 48

48 (47). Podonotal shield with six pairs of setae. Setae on dorsum of opisthosoma in form of heavy spines .... *psophodae* Domrow

Podonotal shield with five pairs of setae. Setae on dorsum of opisthosoma in form of minute rods .... *macclurei* Fain

49 (1). Extensive opisthonotal or mesonotal shield present, irrespective of pygidial complex 50

Only pygidial shield present on opisthonotum .... *bradypteri* (Fain), n. comb.

50 (49). Pygidial complex, if present, fused to opisthonotal shield 51

Pygidial shield discrete 53

51 (50). Opisthonotal shield extended back to include pygidial complex. Sternal shield wider than long .... *neochmiae*, n. sp.

Mesonotal shield not extending back to pygidium; pygidial shield absent. Sternal shield longer than wide 52

52 (51). Genital setae off shield. Sternal, genital, and ventral setae in form of weak rods .... *elbeli* (Strandtmann), n. comb.

Genital setae on shield. Sternal, genital, and ventral setae in form of heavy pegs .... *angrensis* (de Castro), n. comb.

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* The nature of the podonotal shield is unknown in *P. novaeguineae* (Hirst) (see Fain and Hyland, 1962*b*), and it is therefore keyed out through both halves of this couplet.

53 (50). Opisthonotal shield elongate, bearing three pairs of setae. SI on shield. Anal shield evenly sclerotized. Leg setae in form of small spines .... *dioptrornis* Fain
Opisthonotal shield quadrate, bearing two pairs of setae. SI off shield. Anal shield with heavily sclerotized band between anus and cribrum. Many leg setae large and inflated .... *dicruri* Fain

PTILONYSSUS MALURI Domrow

Ptilonyssus maluri Domrow, 1965, *Acarologia,* 7: 451. *Neonyssus maluri,* Bregetova, 1967, *Parazit. Sb.,* 23: 133.

Previous record.—Red-backed wren, *Malurus melanocephalus* (Latham) (Sylviidae, Passeriformes), Esk.

PTILONYSSUS COLLURICINCLAE Domrow

Ptilonyssus colluricinclae Domrow, 1964, *Acarologia,* 6: 596. *Neonyssus colluricinclae,* Bregetova, 1967, *Parazit. Sb.,* 23: 133.

Previous record.—Grey shrike-thrush, *Colluricincla harmonica* (Latham) (Pachycephalidae, Passeriformes), Brisbane. Also Wilson's Peak and Esk.

New host records.—Rufous shrike-thrush, *C. megarhyncha* (Quoy and Gaimard), Innisfail, vi–ix. 1965, G. J. B., R. D., H. I. McD., and J. S. W. (52♀♀, 10 protonymphs); Esk, 14.vii.1965, R. D. and J. S. W. (47♀♀, 5 nymphs). Golden whistler, *Pachycephala pectoralis* (Latham), Innisfail, 1.ix.1965, H. I. McD. (11♀♀). Grey whistler, *P. griseiceps* Gray, Innisfail, 9.vii.1965, G. J. B. and H. I. McD. (1♀).

PTILONYSSUS CAPITATUS (Strandtmann)

(Figs 82–89)

Paraneonyssus capitatus Strandtmann, 1956, *J. Kans. ent. Soc.,* 29: 133. *Astridiella capitatus,* Fain, 1959, *J. ent. Soc. sth. Afr.,* 22: 21. *Neonyssus* (*Otocorinyssus*) *capitatus,* Bregetova, 1967, *Parazit. Sb.,* 23: 127.

This species may now be recorded from Australia: 2♀♀ from a Horsfield bushlark, *Mirafra javanica* Horsfield (Alaudidae, Passeriformes), Kowanyama, 3.iv.1965, R. D. The only previous record is from an American lark (*Otocoris* Bonaparte).

PTILONYSSUS CARDUELIS Fain

Ptilonyssus carduelis carduelis Fain, 1962, *Bull. Annls Soc. r. ent. Belg.,* 98: 253. *Neonyssus* (*Frigilonyssus*) *carduelis carduelis,* Bregetova, 1967, *Parazit. Sb.,* 23: 130. *Ptilonyssus carduelis chloris* Fain, 1962, *Bull. Annls. Soc. r. ent. Belg.,* 98: 257. New synonymy. *Neonyssus* (*Frigilonyssus*) *carduelis chloris,* Bregetova, 1967, *Parazit. Sb.,* 23: 130.

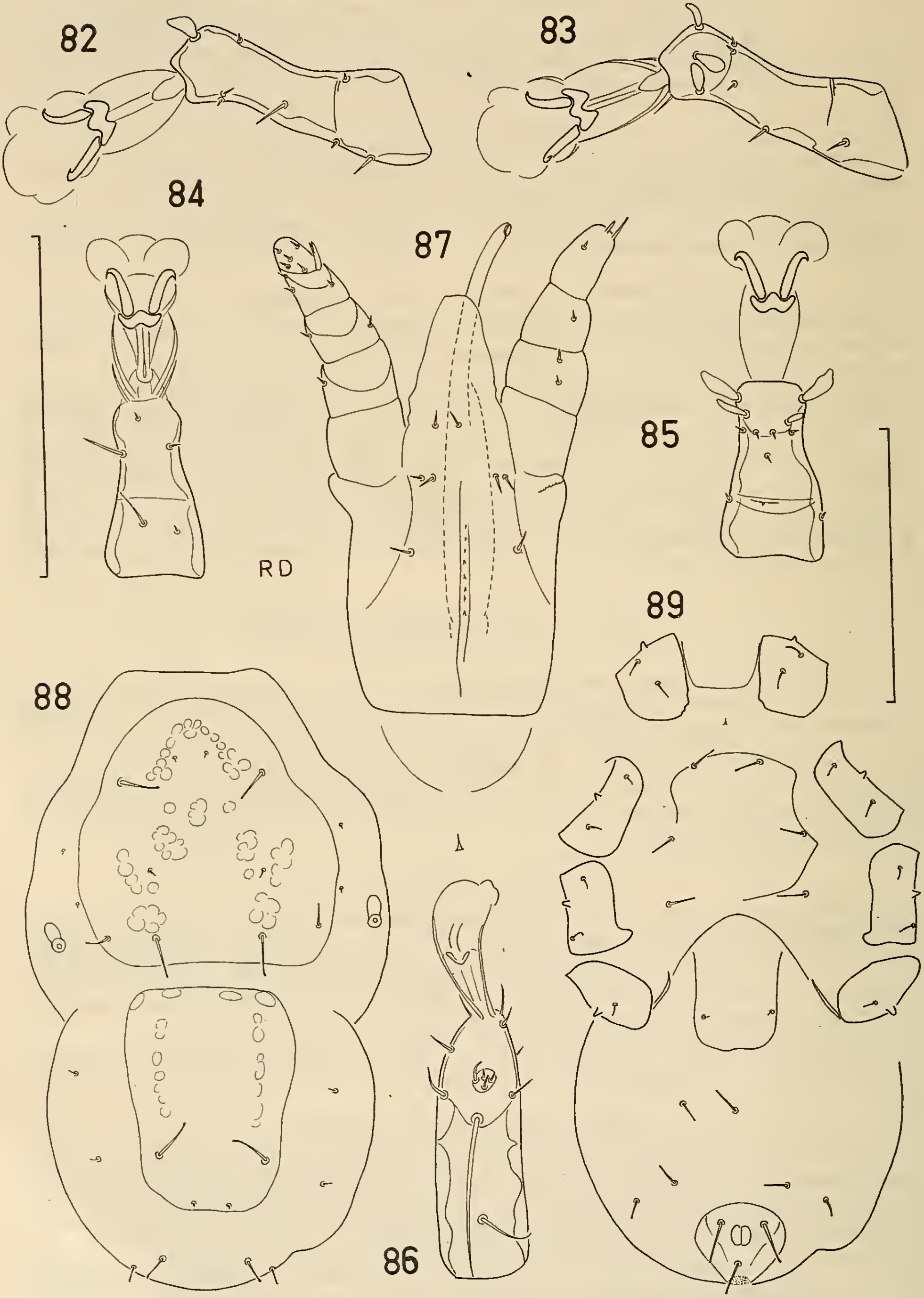
Previous record.—Greenfinch (introduced), *Chloris chloris* (Linnaeus) (Fringillidae, Passeriformes).

PTILONYSSUS EMBERIZAE Fain

Ptilonyssus emberizae Fain, 1956, *Revue Zool. Bot. afr.,* 53: 140; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 95; 1958, *Bull. Soc. r. Zool. Anvers,* 9: 7; 1963, *Bull. Annls Soc. r. ent. Belg.,* 99: 168. *Neonyssus* (*Paraneonyssus*) *emberizae,* Bregetova, 1967, *Parazit. Sb.,* 23: 133.

Previous records (both Passeriformes).—Common swallow (vagrant), *Hirundo rustica* Linnaeus (Hirundinidae). Gouldian finch, *Poephila gouldiae* (Gould) (Ploceidae).

Fain (1963*d*) comments on the close relationship between this species and *P. icteridius* (Strandtmann and Furman, 1956). Should they prove synonymous, the former has priority by six months.



Figs 82–89. *Ptilonyssus capitatus* (Strandtmann) (♀ from *Mirafra javanica*).–82–83, Lateral views of tarsus IV. 84–85, Dorsal and ventral views of tarsus II. 86, Dorsal view of tarsus I. 87, Ventral view of capitulum (left palp in dorsal view). 88–89, Dorsal and ventral views of idiosoma, with anal shield foreshortened.

PTILONYSSUS PYGMAEUS (Bregetova), n. comb.

Neonyssus (*Spizonyssus*) *pygmaeus* Bregetova, 1967, *Parazit. Sb.*, 23: 131.

Previous record.—Goldfinch (introduced), *Carduelis carduelis* (Linnaeus) (Fringillidae, Passeriformes).

PTILYONYSSUS HIRSTI (de Castro and Pereira)

Neonyssus hirsti de Castro and Pereira, 1947, *Archos Inst. biol., S Paulo*, 18: 129; Porter and Strandtmann, 1952, *Tex. J. Sci.*, 4: 394. *Paraneonyssus hirsti*, Feider, 1962, *Studii Cerc. stiint. Iăsi*, 13: 48. *Ptilonyssus hirsti*, Fain, 1963, *Bull. Annls Soc. r. ent. Belg.*, 99: 170; Domrow, 1964, *Acarologia*, 6: 608. *Ptilonyssus nudus* Berlese, 1892, "Acari, myriapoda, et scorpiones hucusque in Italia reperta, ordo Mesostigmata" (Patavii), fasc. 54, No. 1 (♂), *nec* Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest*, 2: 130. *Ptilonyssus nudus* Hirst, 1916, *J. zool. Res.*, 1: 73 (♀), *nec* Berlese and Trouessart, *Loc. cit.*

Previous record.—House-sparrow (introduced), *Passer domesticus* (Linnaeus) (Fringillidae, Passeriformes), Brisbane.

This material compares well with specimens from the United States.

PTILONYSSUS NEOCHMIAE, n. sp.
(Figs 78–80, 90–91)

Diagnosis.—According to Thomson (1964), *Vidua* Cuvier, *Hypochera* Bonaparte, and *Steganura* Reichenbach are a group of three very similar genus-group taxa of ploceid affinities, from which nasal mites of the genus *Ptilonyssus* have been described as follows: *P. viduae* Fain (1956, 1957*e*), *P. hypocherae* (Fain, 1963*e*), n. comb., and *P. steganurae* Fain (1967*b*).

P. viduae is the type-species of *Passeronyssus* Fain (1960*f*, 1962*c*), the genus in which *P. hypocherae* was originally placed, and neither species shows the stigmata extended anteriorly into peritremes. However, in *P. steganurae*, and in the species with which Fain originally thought to associate it, *P. intermedius* (Hirst, 1921*b*) (see also Fain, 1960*a*; Fain and Hyland, 1962*b*), peritremes are present.* Fain also compares *P. steganurae* with *P. ploceanus* Fain (1956), a species he treats more fully in 1957*e*, together with several other related species, all possessing peritremes, from other ploceid and fringillid genera. It is clear, therefore, that we are in the presence of congeners, and the essential criterion of difference listed by Fain between *Ptilonyssus* and *Passeronyssus* (peritremes present or absent) no longer holds good.

The new ploceid parasite, *P. neochmiae*, lacking peritremes, but possessing an extensive opisthonotal shield, is therefore best compared, not with *P. viduae*, but with *P. hypocherae*. It is readily separable, however, by the absence of anterolateral extensions to the podonotal shield, the relatively broader dimensions of the opisthonotal shield, and the length and position of the anal setae.

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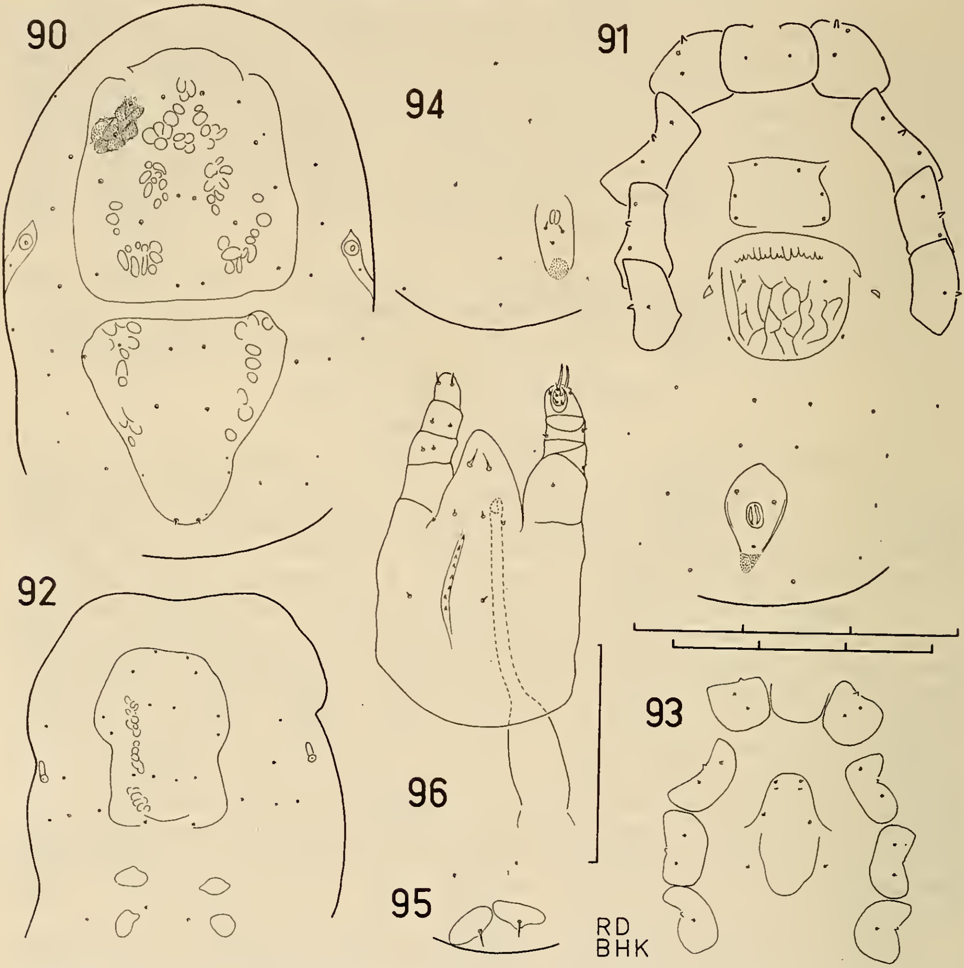
*The unique specimen of *P. intermedius* is alleged on Trouessart's label to have come from a Malagasy bird, but it should always be kept in mind that, as this worker collected much of his material from dried museum skins, his data should always be verified by fresh material. For example, listrophorid mites said by Trouessart to have come from an African rodent, and described by Lawrence (1956) as *Cricetomysia andrei*, proved to be *Campylochirus chelopus* Trouessart (1893), a parasite of a peculiarly Tasmanian marsupial (Domrow, 1958). Also, Trouessart himself (1896) expressed the probability that *Chirodiscus amplexans* Trouessart and Neumann (1890), described from the feathers of an Australian bird, will also prove to belong to the Listrophoridae, a family modified towards a lifelong attachment to single mammalian hairs.

Types.—Holotype female and four paratype females from a crimson finch, *Neochmia phaeton* (Hombron and Jacquinot) (Ploceidae, Passeriformes), Innisfail, 3.viii.1966, M. L. F. Holotype N. I. C.; paratypes R. D. and A. F.

Female.—Idiosoma 510μ long in slightly distorted specimen figured. Podonotal shield (Fig. 90) slightly longer than wide, 230–240μ long, 210–220μ wide; anterior margin irregularly convex, sides subparallel, and posterior margin straight. Setae in eight pairs; surface reticulate, strongly punctate, and marked by muscle insertions. Opisthonotal shield sub-triangular, with rounded corners, length 192–196μ, width 187–192μ. Six setae normally present anteriorly, in hexagonal arrangement; pygidial setae present. Dorsal cuticle with three pairs of setae flanking podonotal, and several setae and pores flanking opisthonotal shield. Stigmata without peritremes, borne on weakly sclerotized, posteriorly extended stigmatic shields.



Figs 90–91. *Ptilonyssus neochmiae*, n. sp. (♀ from *Neochmia phaeton*).–Dorsal and ventral views of idiosoma.

Figs 92–96. *Ptilonyssus sittae* Fain (protonymph from *Climacteris picumnus*).–92–93, Dorsal and ventral views of podosoma. 94, Anal shield. 95, Pygidium. 96, Ventral view of capitulum (right palp in dorsal view).

Sternal shield (Fig. 91) very weakly sclerotized, with SI–III, but no pores, on shield proper. Metasternal setae absent. Genital shield short and broad, reticulate and shagreened, and with narrow, rayed operculum. Genital setae set well forward on shield, with associated pores set free in cuticle near posterior margin of shield. Anal shield angularly convex anteriorly, and with cribrum posteriorly. Anus centrally placed, preceded by adanal, and followed by postanal seta. Ventral cuticle with several pairs of setae and pores. All body setae minute.

All leg setae minute, except for those at apex of tarsi II–IV (Figs 79–80). Coxae 2.2.2.1. Trochanter I (1–0/2–1), II (1–0/3–1), III–IV (1–0/3–0). Femora I–II (1–4/1–1), III (1–3/1–0), IV (1–2/1–0); genua I–III (1–4/2–1), IV (1–4(3)/1–0). Tibiae (1–3/2–1). Tarsi –.17.17.17 (*mv* absent). Setae al_1, av_1, pv_1, and pl_1 on tarsi II–IV, particularly ventral pair, considerably stronger than remainder of setae on ventral aspect. Claws I weak, but not clearly visible; ambulacrum I also weaker and more slender than II–IV.

Basis capituli (Fig. 78) with pair of weak capitular setae, but deutosternum absent. HI absent, II–III present, but very weak. Palpal setae weak, apart from two dorsodistal tibial rods. Tarsus obsolescent, with two slender setae. Strong claw present. Chelicerae attenuate in distal half, with chelate portion occupying one-thirteenth of total length. Tritosternum absent.

PTILONYSSUS STRUTHIDEAE, n. sp.

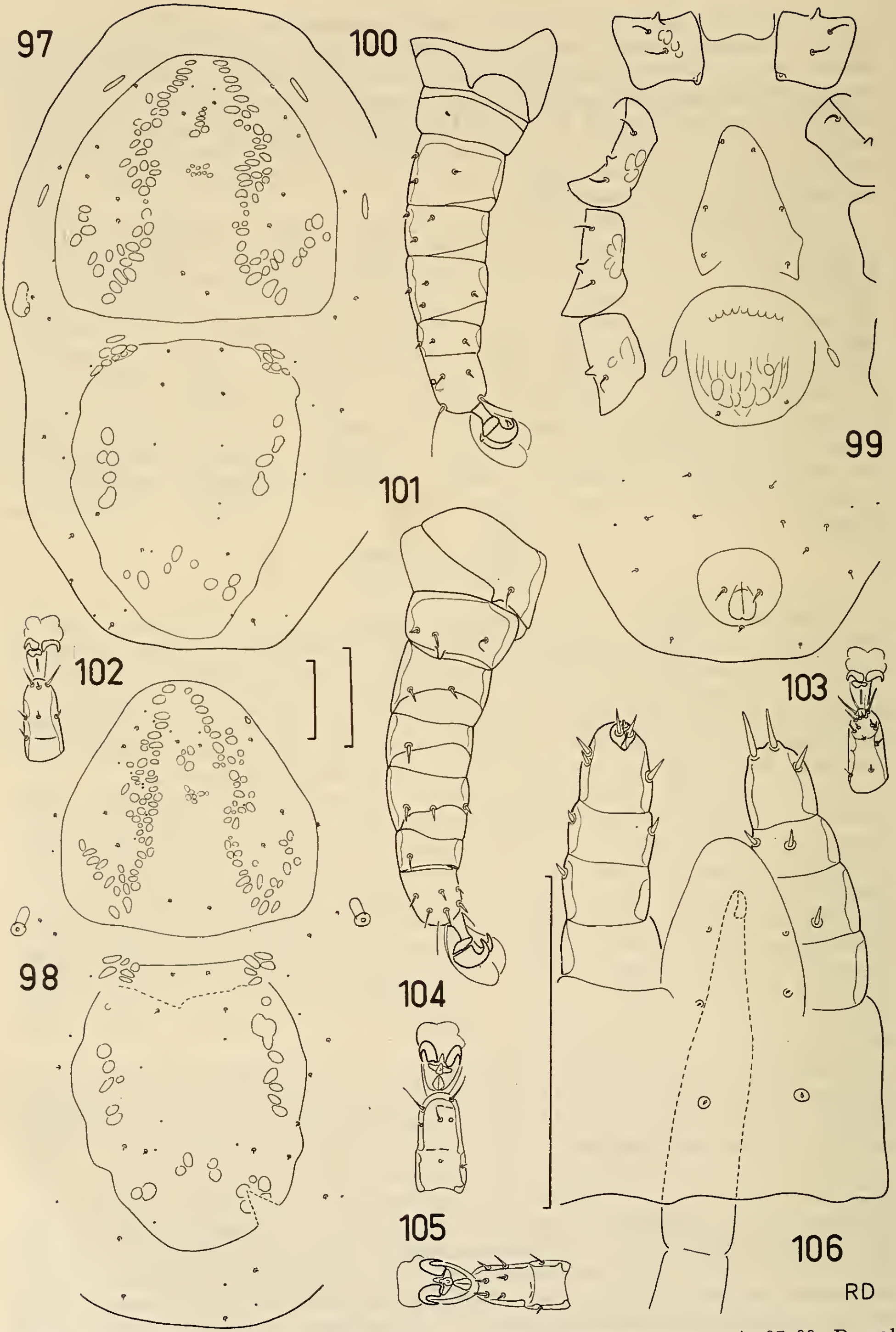
(Figs 97–106)

Diagnosis.—Leach (1958), whose classification of Australian birds I am presently using, places *Struthidea* Gould and *Corcorax* Lesson among the Corvidae and *Grallina* Vieillot as the sole member of the Grallinidae. However, Mayr and Amadon (1951) have grouped these three genera — mainly on a characteristic habit, all build a bowl-shaped mud nest — into the Grallinidae, recognizing two subfamilies, Grallinae (*sic*) for the peculiar *Grallina* and Corcoracinae for the more closely related *Struthidea* and *Corcorax*.

This subfamilial classification parallels that of their respective nasal mites — the slender-bodied *Ptilonyssus grallinae* Domrow (1964*c*) is quite distinct from the thick-set *P. struthideae*, n. sp., and *P. corcoracis*, n. sp., in showing the following characters: podonotal shield strongly excavated posterolaterally, thereby flanking peritrematalia; pygidial shield distinct; anal shield elongate, with distinct cribrum, but without postanal seta; body setae strong and peg-like; coxa II with anterodorsal process; leg chaetotaxy: coxae 2.2.2.1; trochanters I–II (0–0/3–1), III (2–0/2–0), IV (1–0/5–0); femur I (2–4/0–2), II (1–4/1–1), III (1–3/1–0), IV (1–3/2–0); genua I–III (1–4/0–1), IV (1–3/0–0); tibiae (1–3/2–1); tarsi –.17.17.17 (*mv* lacking); palpal chaetotaxy 1.2.4.6.

However, both in general (*facies*) and in particular (chaetotaxy of legs and palpi), the two new species are very similar indeed and are separable, as noted above, only on the degree of sclerotization of the dorsal shields and the setation of tarsus IV.

In view of the uncertain relationships of their two host genera, it is difficult to point to any species of *Ptilonyssus* as a possible relative, even confining one's attention to the species with extensive opisthonotal shields. Of the Australian species in this category — omitting *P. hirsti* (de Castro and Pereira, 1947) from the introduced *Passer domesticus*, a fringillid — *P. ailuroedi* Domrow (1964*b*), from ptilonorhynchids, is readily separable by its four immense mesonotal setae; *P. colluricinclae* Domrow (1964*c*), from pachycephalids, by the shape and setation of the dorsal shields and the armature of tarsi II–IV; and *P. maluri* Domrow (1965*c*), from a sylviid, by the presence of metasternal setae and a distinct deutosternum.



Figs 97–106. *Ptilonyssus struthideae*, n. sp. (♀ from *Struthidea cinerea*).–97–99, Dorsal and ventral views of idiosoma. 100–101, Dorsal and ventral views of leg IV. 102–103, Ventral and dorsal views of tarsus I. 104–105, Dorsal and ventral views of tarsus IV. 106, Ventral view of capitulum (left palp in dorsal view).

It has since come to my notice that *P. struthideae* is much more closely related to *P. nucifragae* (Hirst, 1923) (see also Fain, 1960*a*; Bregetova, 1967), whose host, *Nucifraga caryocatactes* (Linnaeus) is likewise a corvid (Thomson, 1964), a relationship which would urge caution in accepting Mayr and Amadon's findings (1951). I have seen two pairs of Hirst's species, but the new species is readily distinguished by the different shapes of both its dorsal shields, the posterior reduction of its anal shield, and the uniformity in length of its coxal setae.

Types.—Holotype female and two paratype females from apostle-birds, *Struthidea cinerea* Gould (Corvidae, Passeriformes), Condamine, 29.v.1965, H. A. S.; Condamine, 6.vii.1963, I. D. F.; and Charleville, 1.ii.1967, R. D. and J. S. W. Holotype N. I. C.; paratypes R. D.

Female.—Idiosoma relatively stout, 660μ long in somewhat flattened specimen. Podonotal shield (Figs 97–98) very slightly wider than long, strongly arched anterolaterally, and virtually straight posteriorly; bearing six or seven pairs of minute setae. Opisthonotal shield one-third again as long as wide, tapering irregularly to convex posterior margin; bearing two pairs of setae anteriorly, and three to five irregularly arranged setae posteriorly, none of which appear to be pygidials. Both shields closely punctate except for very narrow marginal strip, marked by distinct muscle insertions, and showing few weak pores. Body cuticle with four shieldlets and six setae flanking podonotal, and about eight setae and pores flanking opisthonotal shield. Stigmata provided with short peritremes.

Sternal shield (Fig. 99) narrower anteriorly, virtually textureless, and outlined only by cessation of cuticular striae; bearing SI–III, but without pores. Metasternal setae absent. Genital shield short and broad, showing few muscle insertions and reticulate pattern more densely sclerotized than remainder of shield; with rayed operculum anteriorly and two minute setae posteriorly. Anal shield weakly sclerotized, with anus almost at posterior margin; adanal setae near anterior of anus, postanal submarginal; cribrum quite absent. Cuticle with about six pairs of setae and few pores.

Legs stout, with truncate tarsi bearing ambulacra ventrodistally (Figs 100–101). Setae generally short and spinose. Coxae 2.2.2.1. Trochanter I (1–0/2–1), II (0–0/3–1), III (1–0/3–0), IV (1–0/2–0). Femur I (1–4/2–1), II (1–4/1–1), III–IV (1–3/1–0). Genu I (1–4/2–1), II–III (1–4/0–1), IV (1–3/0–0). Tibiae (1–3/2–1). Tarsi –.17.17.16 (II–IV lacking *mv*; IV also lacking ad_2, its relative position in II and III being indicated in Figs 100 and 104 by a small circle; av_1 and pv_1 slightly stronger). Ambulacra II–IV (Figs 104–105) with strong articulatory sclerites supporting heavy claws. Ambulacrum I similar (Figs 102–103), but much smaller.

Tritosternum and deutosternum absent (Fig. 106). Capitular and hypostomal setae III minute; remaining two pairs of hypostomals obsolescent or absent. Palpi with usual five segments, but tarsus much reduced and completely obscured dorsally by tibia. Setal formula 0.2.4.6. Tarsus with one smaller and two larger setae; claw present, with indication of bifid tip under oil immersion. Cheliceral shaft of uniform diameter basally, but tapering in distal third; chelatae portion occupying one-fifteenth of total length.

PTILONYSSUS CORCORACIS, n. sp.

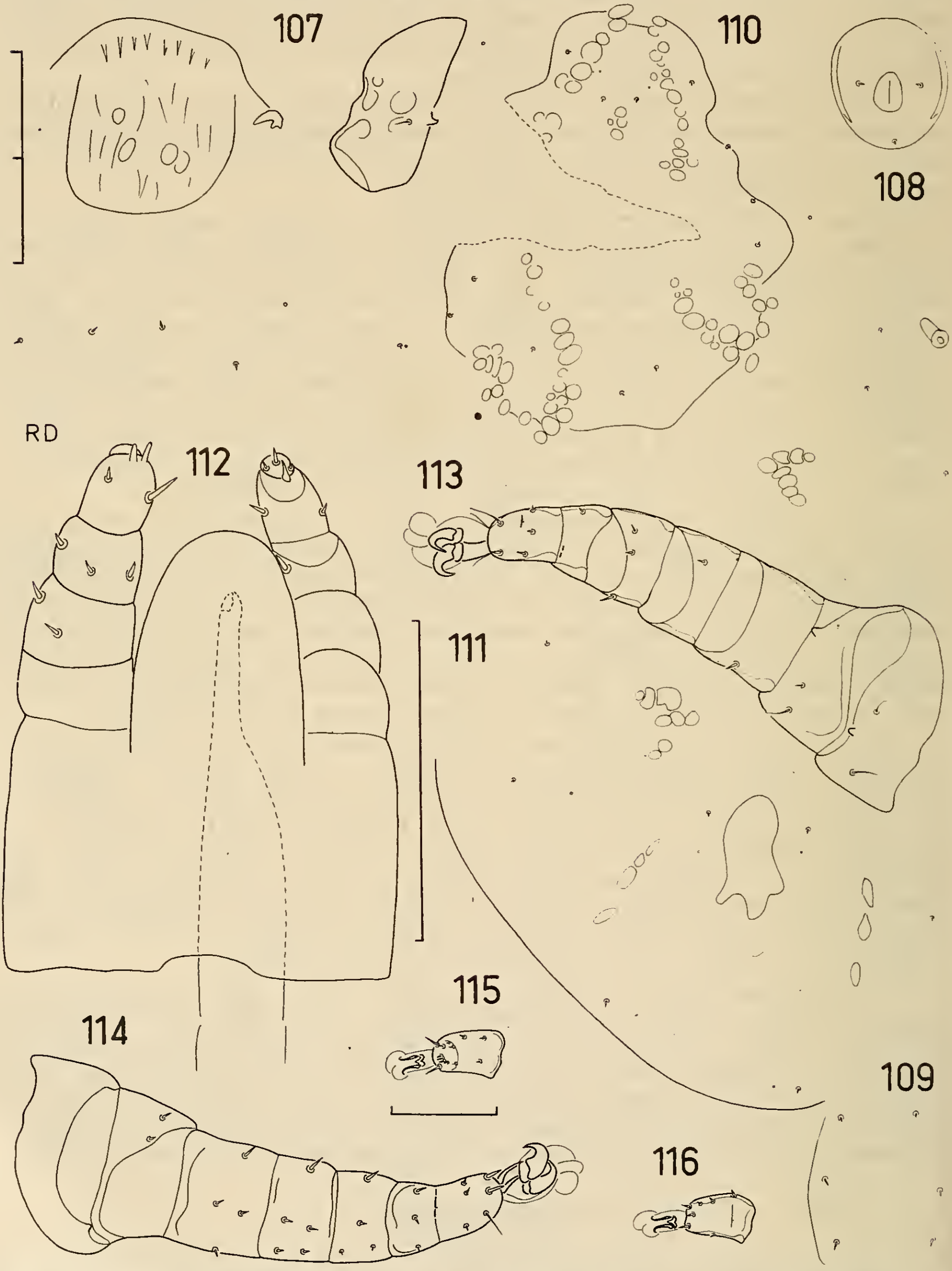
(Figs 107–116)

Diagnosis.—See that for *P. struthideae,* n. sp., above.

Types.—Holotype female from a white-winged chough, *Corcorax melanorhamphus* (Vieillot) (Corvidae, Passeriformes), Condamine, 6.vii.1963, I. D. F. Holotype N. I. C.

Also 6♀♀ and 2♂♂ from *C. melanorhamphus*, Charleville, 28.i.1967, R. D. and J. S. W.

Female.—Idiosoma about 880μ long in mounted, somewhat compressed material. Podonotal shield (Fig. 110) approximately as wide as long, but



Figs 107–116. *Ptilonyssus corcoracis*, n. sp. (♀ from *Corcorax melanorhamphus*).–107, Sternal shield and coxa IV. 108, Anal shield. 109, Sternal setae. 110, Podonotum, with one mesonotal shieldlet. 111, Opisthonotum, with other mesonotal shieldlet. 112, Ventral view of capitulum, with basis not clear (right palp in dorsal view). 113–114. Ventral and dorsal views of leg III. 115–116, Dorsal and ventral views or tarsus I.

narrower anteriorly and slightly convex midposteriorly; outline generally indistinct and eroded, particularly around anterior and posterolateral muscle insertions; bearing six pairs of minute setae and two pores; surface granulate, marked by regular pattern of muscle insertions. Mesonotum with two shieldlets. Posteromedially an irregular, asetose shield (Fig. 111) flanked on each side by seta and pore: this possibly represents the pygidial complex, although further to each side—and, I fancy, behind—there are additional shieldlets. Body cuticle with occasional setae and pores whose pattern is indiscernable. Stigmata provided with short peritremes.

Sternal plate (Fig. 109) obsolescent, flanked by short, spinose SI–III. Metasternal setae absent. Genital shield (Fig. 107) as in *P. struthideae*, n. sp. Anal shield (Fig 108) subcircular, very weakly sclerotized, without cribrum; anus centrally placed, flanked by three weak anal setae.

Leg chaetotaxy (Figs 113–114) as in *P. struthideae*, but genu IV (1–4/0–0) on one side of holotype, and tarsi –.17.17.17 (*mv* absent; ad_2 present on IV). Tarsus I is depicted in Figs 115–116.

Basis capituli and hypostome obscured in holotype, but other specimens show deutosternum absent, weak capitular setae present, and hypostomal setae (particularly I) obsolescent or absent (Fig. 112). Dorsodistal rods on palpal tibia weaker than in *P. struthideae*. Chelate portion occupying one-twentieth of total length. Tritosternum absent.

PTILONYSSUS TRISCUTATUS (Vitzthum)

Ptilonyssoides triscutatus Vitzthum, 1935, *J. Orn., Lpz.,* 83: 581. *Ptilonyssus triscutatus*, Fain, 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 121; Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 196.

Previous record.—Rainbow-bird, *Merops ornatus* Latham (Meropidae, Coraciiformes), Esk. Also Kowanyama.

PTILONYSSUS DIOPTRORNIS Fain

Ptilonyssus dioptrornis Fain, 1956, *Revue Zool. Bot. afr.,* 53: 137; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 124; 1959, *J. ent. Soc. sth. Afr.,* 22: 26. *Passeronyssus dioptrornis,* Fain, 1960, *Revue Zool. Bot. afr.,* 61: 110; 1962, *Ibid.,* 66: 139; Nadchatram, McClure, and Lim, 1964, *J. fed. Malay St. Mus.,* 9: 105. *Ptilonyssoides dioptrornis,* Strandtmann, 1960, *J. Kans. ent. Soc.,* 33: 142. *Passeronyssus enicuri* Fain and Nadchatram, 1962, *Bull. Annls Soc. r. ent. Belg.,* 98: 276. New synonymy. *Passeronyssus lusciniae* Fain, 1962, *Revue Zool. Bot. afr.,* 66: 140. New synonymy.

This species may now be recorded from Australia: 11♀♀, 1♂, 2 deutonymphs (one enclosing well developed ♀), and 4 protonymphs from pale-yellow robins, *Eopsaltria capito* Gould (Muscicapidae, Passeriformes), Innisfail, 6.vii and 11.viii.1965, G. J. B. and H. I. McD., and Wilson's Peak, 15.v.1967, R. D. and B. H. K.*

The three nominal species comprising this parasite of Turdidae and Muscicapidae (two groups often considered merely as muscicapid subfamilies) do not differ in any way that I would consider beyond the range of individual variation. I have noted above on several occasions that many recent taxa, both at species- and genus-group levels, have been erected with only minor *differences* in mind. It is convenient here to note that it is perhaps even more important to keep *similarities* in mind.

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* The type-host of *P. lusciniae*, the nightingale, *Luscinia megarhynchos* Brehm (Turdidae), was once introduced into Australia, but failed to become established (Cayley, 1963).

PTILONYSSUS DICRURI Fain

Ptilonyssus dicruri Fain, 1956, *Revue Zool. Bot. afr.*, 53: 137; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 122. *Ptilonyssoides dicruri*, Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 140. *Passeronyssus dicruri*, Domrow, 1965, *Acarologia*, 7: 451. *Ptilonyssoides faini* Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 142.

Previous record.—Spangled drongo, *Chibia bracteata* (Gould) (Dicruridae, Passeriformes), Samford and Esk. Also Kowanyama.

I have examined one Thai specimen identified as *P. dicruri* by Strandtmann.

PTILONYSSUS SITTAE Fain

(Figs 92–96, 219–222)

Ptilonyssus sittae Fain, 1965, *Revue Zool. Bot. afr.*, 72: 158; 1966, *Bull. Annls Soc. r. ent. Belg.*, 102: 117.

This species, originally described from a European species of *Sitta* Linnaeus (Sittidae), may now be recorded from Australia: 1 protonymph from a brown tree-creeper, *Climacteris picumnus* Temminck (Certhiidae, Passeriformes), Winbin Creek, 20.i.1966, R. D., D. J. M., and J. S. W.

Keast (1957) placed *Climacteris* Temminck in the family Sittidae, and the matter is further discussed by Thomson (1964).

PTILONYSSUS AILUROEDI Domrow

Ptilonyssus ailuroedi Domrow, 1964, *Acarologia*, 6: 31, 619; Wilson, 1964, *Pacif. Insects*, 6: 381.

Previous record.—Green catbird, *Ailuroedus crassirostris* (Paykull) (Ptilonorhynchidae, Passeriformes), Mt. Glorious. Also Wilson's Peak.

Also 1 ♀ and 1 ? (in poor condition) from *A. crassirostris* (listed on the label under its synonym *A. smithi* (Vigors and Horsfield)), Tweed River, N.S.W., ii.1892, T. S. (see comments above on *Tinaminyssus trichoglossi*).

PTILONYSSUS ELBELI (Strandtmann), n. comb.

Cas elbeli Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 137. *Sternostoma bruxellarum* Fain, 1961, *Bull. Annls Soc. r. ent. Belg.*, 97: 53. New synonymy.

Previous records (both Sturnidae, Passeriformes).—European starling (introduced), *Sturnus vulgaris* Linnaeus. Common myna (introduced), *Acridotheres tristis* (Linnaeus).

I have examined one of Strandtmann's paratypes.

PTILONYSSUS ANGRENSIS (de Castro), n. comb.

Rhinonyssus (*Rhinacarus*) *angrensis* de Castro, 1948, *Archos Inst. biol., S Paulo*, 18: 257. *Cas angrensis*, Baker and Wharton, 1952, "An introduction to acarology" (Macmillan: New York), p. 81; Strandtmann and Wharton, 1958, *Contr. Inst. Acar. Univ. Md*, 4: 169.

This is the first record of this parasite of swallows outside the Americas: 7 ♀ ♀ from the welcome swallow, *Hirundo neoxena* Gould (Hirundinidae, Passeriformes), Kowanyama, 21.x.1966, R. D. and H. A. S. They compare well with 1 ♀ from the United States.

PTILONYSSUS NITZSCHI (Giebel)

Dermanyssus Nitzschi Giebel, 1871, *Z. ges. Naturw.*, 38: 32. The original capitalized spelling should be corrected under Art. 32. *Rhinonyssus nitzschi*, Vitzthum, 1935, *J. Orn., Lpz.*, 83: 572 (*pro parte*). *Neonyssus* (*Vitznyssus*) *nitzchi* (*sic*) de Castro, 1948, *Archos Inst. biol., S Paulo*, 18: 277. *Ptilonyssus* (*Rhinonyssoides*) *nitschi* (*sic*) Pereira and de Castro, 1949, *Archos Inst. biol., S Paulo*, 19: 222. *Vitzuyssus nitzschi*, Strandtmann and Wharton, 1958, *Contr. Inst. Acar. Univ. Md*, 4: 175; Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 131. *Astridiella caprimulgi* Fain, 1957, *Riv. Parassit.*, 18: 96.

Previous record.—Large-tailed nightjar, *Caprimulgus macrurus* Horsfield (Caprimulgidae, Caprimulgiformes).

I agree with Strandtmann and Wharton (1958) that (*i*) it is unnecessary to delete *D. nitzschi*, the first nasal mite described from birds, from the nomenclature; and (*ii*) it would be legitimate to consider the holotype of *A. caprimulgi* as the neotype of *D. nitzschi*. See discussion on *Boydaia crassipes* (Berlese and Trouessart) below.

It is noteworthy that two of the hosts of *P. nitzschi* listed by Fain (1957*e*) also harbour *P. scotornis* Fain (1956, 1957*b*). However, the proportions of the anal shield and the chelicerae appear to distinguish the two taxa. It was, however, illegal of Fain to discard his original holotype of *P. scotornis* for a better specimen from a different host.

PTILONYSSUS ECHINATUS Berlese and Trouessart

Ptilonyssus echinatus Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest*, 2: 129; Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 146; George, 1961, *J. Kans. ent. Soc.*, 34: 114; Domrow, 1964, *Acarologia*, 6: 607. *Hapalognatha platytricha* Butenko, 1959, *Nauch. Dokl. vȳssh. Shk.*, 2: 17 (*nomen nudum*); 1960, *Zool. Zh.*, 39: 1494. *Ptilonyssus chalybeaedomesticae* do Amaral, 1967, *Archos Inst. biol., S Paulo*, 34: 169. New synonymy. *Ptilonyssus echinatus taperaefuscae* do Amaral, 1967, *Archos Inst. biol., S Paulo*, 34: 199. New synonymy.

Previous records (both Hirundinidae, Passeriformes).—Welcome swallow, *Hirundo neoxena* Gould, Brisbane. Also Kowanyama. Common swallow (vagrant), *H. rustica* Linnaeus.

New host record.—Tree-martin, *Hylochelidon nigricans* (Vieillot) (Hirundinidae), Charleville, 31.i.1967, R. D. and J. S. W. (1 ♀).

All Australian specimens show the pygidial shield divided, as does 1 ♀ from *H. rustica* from the United States.

The above taxa would seem to provide another example of clinal variation. All are parasites of swallows.

PTILONYSSUS PITTAE Domrow

Ptilonyssus pittae Domrow, 1964, *Acarologia*, 6: 26, 618.

Previous record.—Noisy pitta, *Pitta versicolor* Swainson (Pittidae, Passeriformes), Upper Brookfield. Also Innisfail.

PTILONYSSUS CRACTICI Domrow

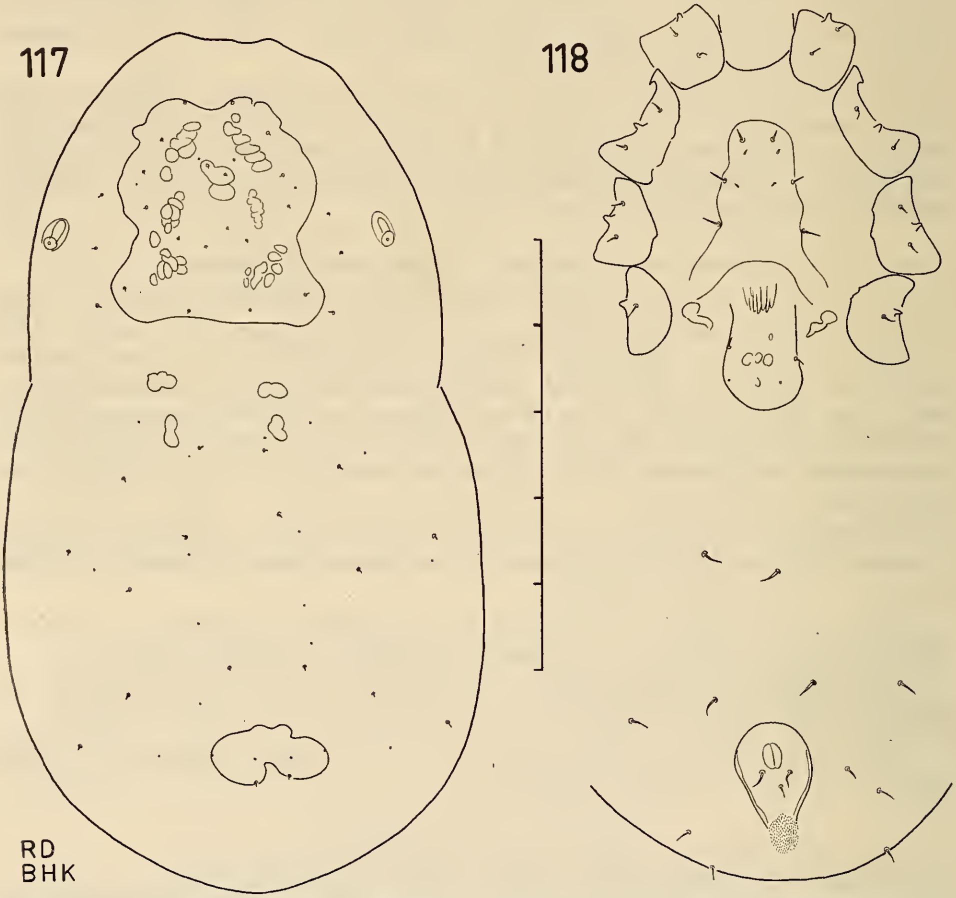
(Figs 117–126)

Ptilonyssus cractici Domrow, 1964, *Acarologia*, 6: 598, 616; 1966, PROC. LINN. SOC. N.S.W., 90: 196.

Previous records.—Laughing kookaburra, *Dacelo gigas* (Boddaert) (Alcedinidae, Coraciiformes), Esk. White-winged triller, *Lalage tricolor* (Swainson) (Campophagidae, Passeriformes), Kowanyama. Also Charleville. Black-backed magpie, *Gymnorhina tibicen* (Latham) (Cracticidae, Passeriformes), Brisbane and Condamine. Also Esk. Pied butcher-bird, *Cracticus* *nigrogularis* (Gould), Logan Village. Grey butcher-bird, *C. torquatus* (Latham), Esk. Black-backed butcher-bird, *C. mentalis* Salvadori and d'Albertis, Chillagoe.

New host record.—Pied currawong, *Streptera graculina* (Shaw) (Cracticidae), Esk, 10.vii.1967, R. D. and B. H. K. (7 ♀ ♀).

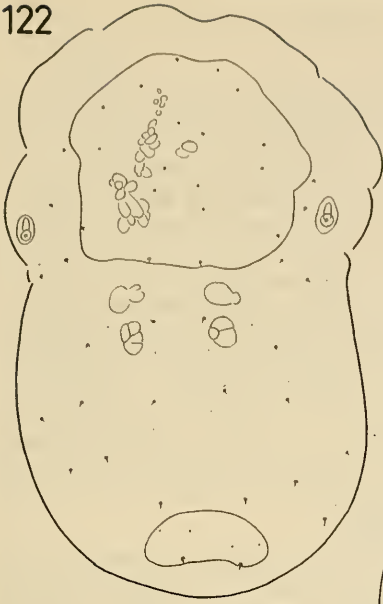
The leg chaetotaxy of specimens from cracticids is as follows. Coxae 2.2.2.1. Trochanters 4.5.4.4. Femur I (2–4/1–2), II (1–4/1–1), III–IV (1–3/0–0). Genua I–III (1–4/0–1), IV (1–2/0–0). Tibiae I–II (1–3/2–1), III–IV (1–3/2–0). Tarsi –.17.17.17. The two posterodorsal setae on genu III are set in relatively larger alveoli. Specimens from *Lalage* Robineau-Desvoidy differ only in showing trochanter II 4. The specimen from *Dacelo* shows a different chaetotaxy on two segments, *viz.* femur IV (1–3/1–0) and tibia IV (1–3/2–1). See also note below on *P. sphecotheris* Domrow.

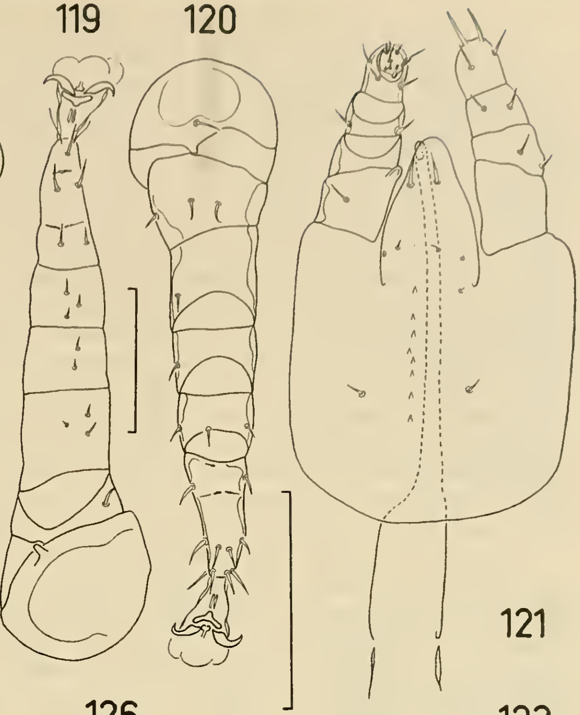


Figs 117–118. *Ptilonyssus cractici* Domrow. (♀ from *Lalage tricolor*).—Dorsal and ventral views of idiosoma.

One magpie in subadult plumage (Esk, 13.ii.1968, R. D. and B. H. K.) yielded 105 ♀ ♀, 9 ♂ ♂, 7 deuto-, and 22 protonymphs. This extremely heavy infestation was confined to the nasal passages, the mites in the drier anterior portions near the nostrils being partially encased in dried nasal secretions. No mites were found in the trachea or lungs.

122





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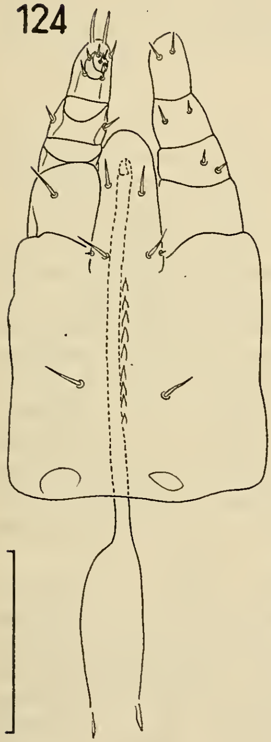
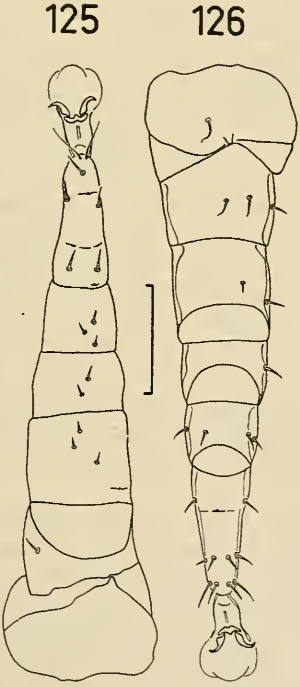
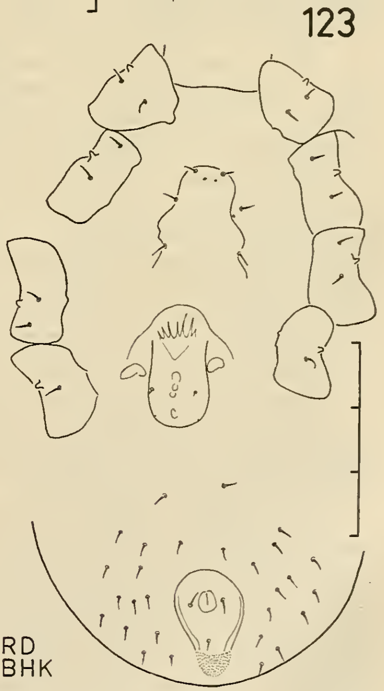






Figs 119–121. *Ptilonyssus cractici* Domrow (♀ from *Lalage tricolor*).–119–120, Dorsal and ventral views of leg IV. 121, Ventral view of capitulum (left palp in dorsal view).

Figs 122–126. *Ptilonyssus cractici* Domrow (♀ from *Dacelo gigas*).–122–123, Dorsal and ventral views of idiosoma. 124, Ventral view of capitulum (with left palp in dorsal view). 125–126, Dorsal and ventral views of leg IV.

PTILONYSSUS MOTACILLAE Fain

(Figs 127–132)

Ptilonyssus motacillae Fain, 1956, *Revue Zool. Bot. afr.*, 53: 143; 1957, *Annls Mus r. Congo belge Sér. 8vo*, 60: 104, 137; 1959, *J. ent. Soc. sth. Afr.*, 22: 24; 1960, *Revue Zool. Bot. afr.*, 61: 109; 1962, *Ibid.*, 66: 128; Domrow, 1964, *Acarologia*, 6: 600; 1965, *Ibid.*, 7: 460. *Ptilonyssus motacilla* (*sic*) Gretillat, 1961, *Vie Milieu*, 12: 155. *Ptilonyssus estrildicola* Fain, 1959, *J. ent. Soc. sth. Afr.*, 22: 22. New synonymy. *Ptilonyssus fringillicola* Fain, 1959, *J. ent. Soc. sth. Afr.*, 22: 28; 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 262. New synonymy. *Hapalognatha prima* Butenko, 1959, *Nauch. Dokl. vȳssh. Shk.*, 2: 17 (*nomen nudum*); 1960, *Zool. Zh.*, 39: 1490. The two species headings on this latter page are transposed. *Ptilonyssus lobatus* Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 147. New synonymy. *Ptilonyssus cinnyricincli* Fain, 1962, *Revue Zool. Bot. afr.*, 66: 132. New synonymy. *Ptilonyssus estrildicola taeniopygiae* Fain, 1963, *Revue Zool. Bot. afr.*, 68: 74; Nadchatram, McClure, and Lim, 1964, *J. fed. Malay St. Mus.*, 9: 105. New synonymy. *Ptilonyssus motacillae phoenicuri* Fain, 1966, *Revue Zool. Bot. afr.*, 74: 90. New synonymy. *Ptilonyssus* sp. Fain and Nadchatram, 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 280. See also Domrow (1966*b*).

Previous records (all Passeriformes).—Rufous whistler, *Pachycephala rufiventris* (Latham) (Pachycephalidae), Mt. Cotton and Samford. Also Esk and Kowanyama. Australian pipit, *Anthus australis* Vieillot (Motacillidae), Esk. Yellow wagtail (vagrant), *Motacilla flava* Linnaeus. Goldfinch (introduced), *Carduelis carduelis* (Linnaeus) (Fringillidae). Zebra finch, *Taeniopygia castanotis* (Gould) (Ploceidae). Common myna (introduced), *Acridotheres tristis* (Linnaeus) (Sturnidae).

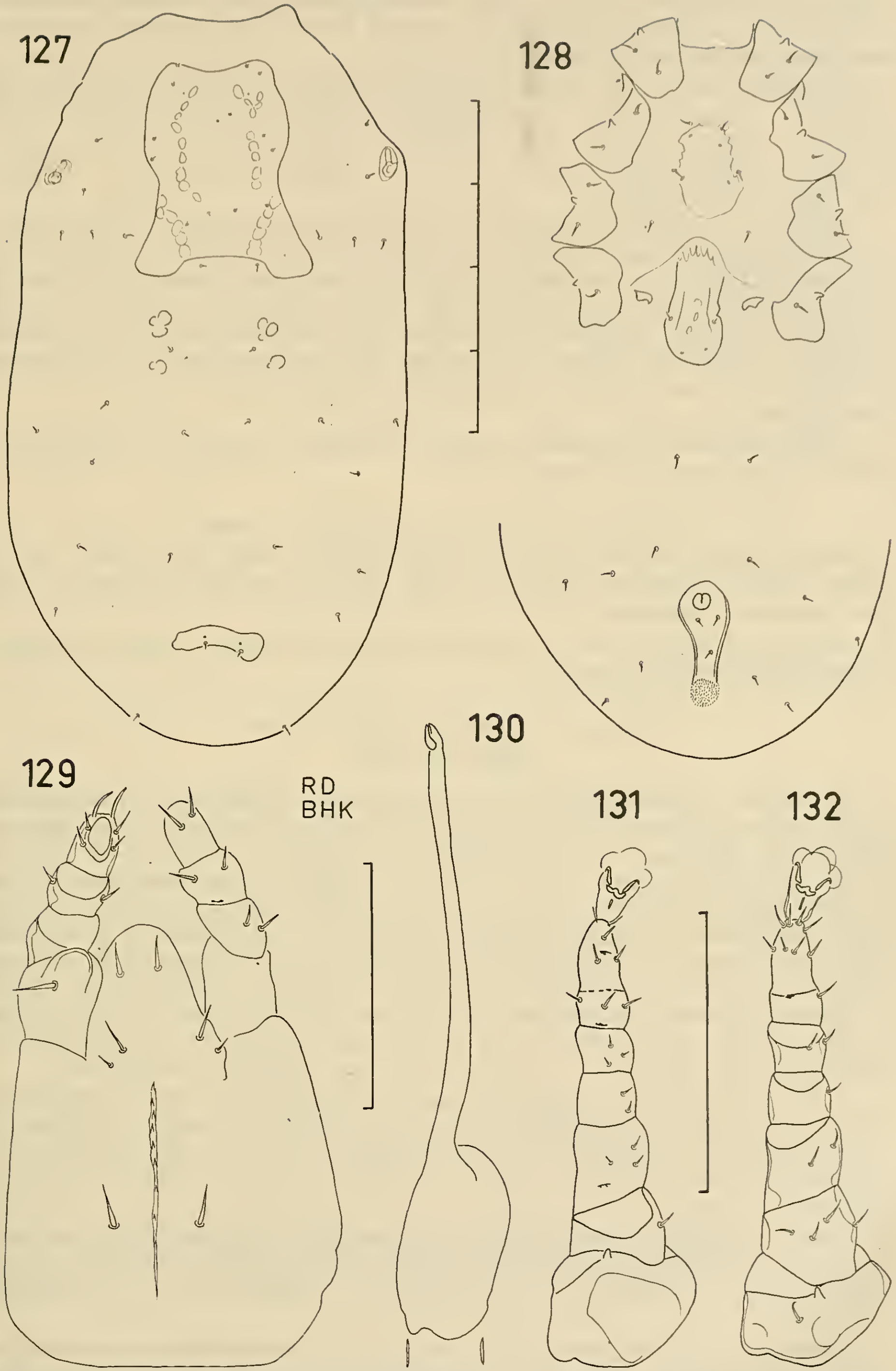
New host records (both Passeriformes).—Rose-robin, *Petroica rosea* Gould (Muscicapidae, Passeriformes), Esk, 17.iv.1967, R. D. and B. H. K. (4 ♀♀, 1 deutonymph). Spice finch (introduced), *Lonchura punctulata* (Linnaeus) (Ploceidae), Innisfail, 3.viii.1965, R. D. and J. S. W. (1 ♀).

Fain (1962*c*) stated that "P. motacillae *présente des légères variations en rapport avec la nature de l'hôte parasité. Ces variations portent sur la forme et les dimensions des écussons et des poils dorsaux, les dimensions du corps et des différents organes, la structure de l'écusson pygidial (simple ou double). Comme il existe tous les intermédiaires entre les formes extrêmes il ne semble pas indiqué de donner à ces variations un rang spécifique ni même subspécifique*". Later (1966*b*), however, he was to describe *P. m. phoenicuri*. A further Australian variant from *Petroica* Swainson is figured on page 353.

In the former paper, Fain also described *P. cinnyricincli* as intermediate between *P. motacillae* and *P. lobatus* in showing incipient mesonotal lobes. Weaker lobes are also present in *P. m. phoenicuri* and in Australian specimens from *Pachycephala* Vigors.

Fain (1959, 1962*a*) noted variation in the pygidial shield of specimens of *P. fringillicola* from *Emberiza* in Africa and *Carduelis* Brisson in Europe, and one of the latter specimens is very similar to *P. motacillae*. In particular, it shows a process anterodorsally on coxa II as well as ventrointernally on the palpal trochanter. The African *P. estrildicola* and its Australian subspecies, *P. e. taeniopygiae*, would also be synonymous by the present criteria. The two-toned illustrations of *P. tillae* Fain (1959), from an African starling, are too dense to allow of a decision on its status.

There has also been described (de Castro, 1948; George, 1961; Fain, 1964*b*) a group of closely related taxa from neotropical and nearctic passerines, but I have no experience of them. Their *chefs de file* are *P. sairae* de Castro and *P. japuibensis* de Castro.



Figs 127–132. *Ptilonyssus motacillae* Fain (♀ from *Petroica rosea*).– 127–128, Dorsal and ventral views of idiosoma. 129, Ventral view of capitulum, with palpal tarsus not clear (left palp in dorsal view). 130, Ventrolateral view of chelicera. 131–132, Dorsal and ventral views of leg IV.

The only tangible way in which the specimens from *Petroica* Swainson differ from the earlier Australian material is that the pygidial shield is entire rather than divided (Fig. 127).

Specimens from all three Australian hosts have the following leg chaetotaxy. Coxae 2.2.2.1. Trochanters 4.4.4.5. Femur I (2–4/1–2), II (1–4/1–1), III (1–3/0–0), IV (1–3/1–0). Genua I–III (1–4/0–1), IV (1–2/0–0). Tibiae I–II (1–3/2–1), III–IV (1–3/2–0) but often (1–3/1–0). Tarsi –.17.17.17 (*mv* absent).

Fain's *P. e. estrildicola* came from various African ploceids, and his later *P. e. taeniopygiae* from *T. castanotis* which died in Antwerp shortly after their importation from Australia. In view of the large number of species of various families of mites parasitizing the nasal passages of birds now known to occur in related African, S.E. Asian, and Australian hosts, I would accept this record as a natural infestation. The specimen from *L. punctulata* shows the three anal setae in almost the same transverse line, *cf. P. e. taeniopygiae.*

I have been able to examine 1 ♀ from *Carduelis* (labelled *P. fringillicola*) and 6 ♀ ♀ paratypes of *P. lobatus.*

Ptilonyssus langei (Butenko), n. comb.

Hapalognatha langei Butenko, 1959, *Nauch. Dokl. vȳssh. Shk.,* 2: 17 (*nomen nudum*); 1960, *Zool. Zh.,* 39: 1490. The two species headings on this latter page are transposed.

Previous record.—Common swallow (vagrant), *Hirundo rustica* Linnaeus (Hirundinidae, Passeriformes).

Ptilonyssus orthonychus, n. sp.

(Figs 133–137)

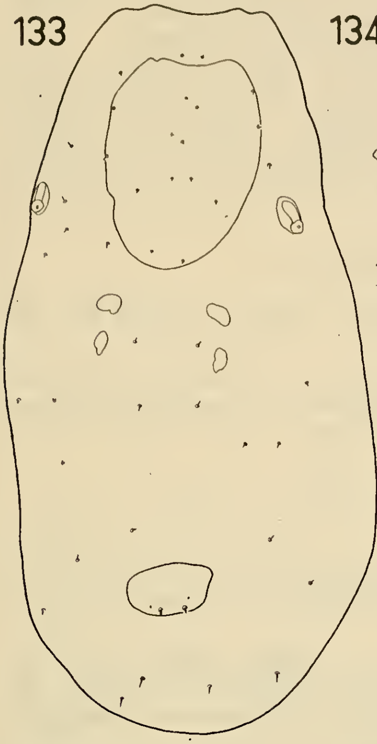
Diagnosis.—This morphologically nondescript species seems best compared with *P. malaysiae* Fain (1964*a*), originally described from the fairy bluebird, *Irena puella* (Latham). *Irena* Horsfield, incidentally, is placed at the end of the family Aegithinidae by McClure (1963), leading immediately into the Timaliidae, to which *Orthonyx* Temminck, the host of the new species, belongs. However, in all the following characters, *P. malaysiae* is at variance with *P. orthonychus*: podonotal shield associated with seven pairs of setae (excluding five pairs set between the shield and the peritrematalia — these are commonly present throughout the species of *Ptilonyssus*); genital setae not set on shield; adanal setae set in front of anus; coxa II with anterodorsal process; tarsi II–IV with av_1 and pv_1 spur-like; capitular setae absent.

If the Timaliidae are considered merely a subfamily of the Muscicapidae (Keast, 1961; Thomson, 1964), the only Australian species recalling *P. orthonychus* is *P. microecae* Domrow (1966*b*). The two may, however, be separated by setational details of the podonotal and anal shields, legs, and capitulum.

Types.—Holotype female and eight paratype females from southern chowchillas, *Orthonyx temminckii* Ranzani (Timaliidae, Passeriformes), Wilson's Peak, 15.v.1967, R. D. and B. H. K. Holotype N. I. C.; paratypes R. D. and A. F.

Female.—A lightly sclerotized species with particularly weak setation (Fig. 133); idiosoma 825μ long in engorged, somewhat flattened specimen figured. Podonotal shield suboval, but slightly broader and weakly concave anteriorly, length 245–286μ, breadth 183–250μ; associated setae in nine pairs, of which verticals and one or two anterolateral pairs are normally free in adjacent cuticle. Cuticle between shield and peritremes with additional five pairs of setae arranged 1.1.3. Mesonotum with usual four shieldlets and transverse band of ten setae. Pygidial shield entire, transverse, with two setae and accompanying pores, and surrounded by about five pairs of setae slightly stronger than remainder of dorsal series.

133



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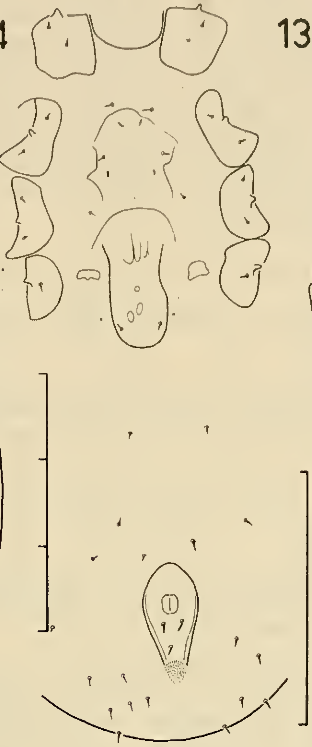

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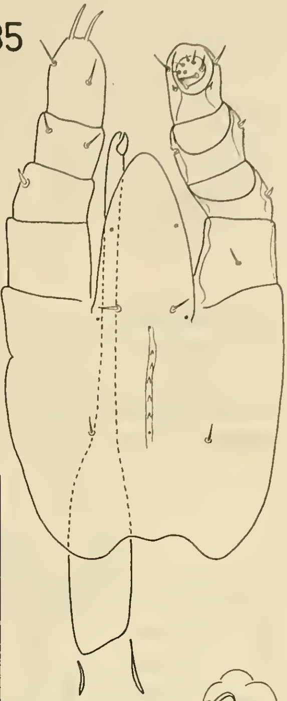

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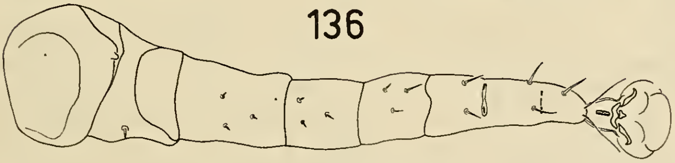

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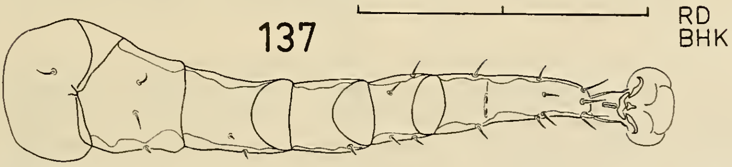

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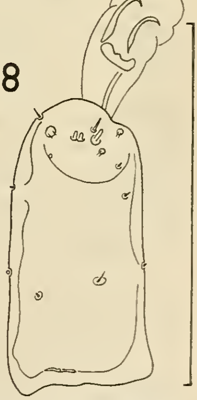


Figs 133–137. *Ptilonyssus orthonychus*, n. sp. (♀ from *Orthonyx temminckii*).–133–134, Dorsal and ventral views of idiosoma. 135, Ventral view of capitulum (right palp in dorsal view). 136–137, Dorsal and ventral views of leg IV.

Fig. 138. *Sternostoma neosittae*, n. sp. (♀ from *Neositta striata*).–Dorsal view of tarsus I.

Sternal shield (Fig. 134) evanescent, marked only by cessation of cuticular striae, bearing four pores and SII, leaving SI and III free in cuticle. Metasternal setae absent. Genital shield ligulate, with few indications of muscle insertions and rayed operculum; genital setae set on shield, but attendant pores free in cuticle. Anal shield elongate, strongly arched anteriorly; anus in front of all three anal setae; cribrum present. Ventral cuticle with about ten pairs of slightly stronger setae.

Coxa II without anterodorsal process and leg setation undistinguished (Figs 136 and 137). Coxae 2.2.2.1. Trochanters I–II (1–0/2–1), III–IV (1–0/3–0). Femur I (2–4/1–2), II (1–4/1–1), III (1–3/0–0), IV (1–3/1–0). Genua I–III (1–4/0–1), IV (1–3/0–0). Tibiae (1–3/2–1). Tarsi –.17.17.17 (*mv* absent; II–IV with av_1 and pv_1 only very slightly enlarged).

Basis capituli (Fig. 135) with two capitular setae and about seven small denticles in single file in deutosternal groove. Hypostome with HIII subequal to capitular setae, but HI and II obsolescent. Palpal setal formula 1.2.4.8. Tarsus with several weak setae and remnant of claw. Chelicerae attenuate in distal three-fifths, chelate portion occupying one-twentieth of total length. Tritosternum absent.

Ptilonyssus microecae Domrow

Ptilonyssus microecae Domrow, 1966, Proc. Linn. Soc. N.S.W., 90: 196; 1967, *Ibid.*, 91: 219.

Previous records.—Jacky winter, *Microeca fascinans* (Latham) (Muscicapidae, Passeriformes), Esk. Also Charleville and Kowanyama. Lemon-breasted flycatcher, *M. flavigaster* Gould, Kowanyama.

Ptilonyssus terpsiphonei Fain

(Figs 139–152)

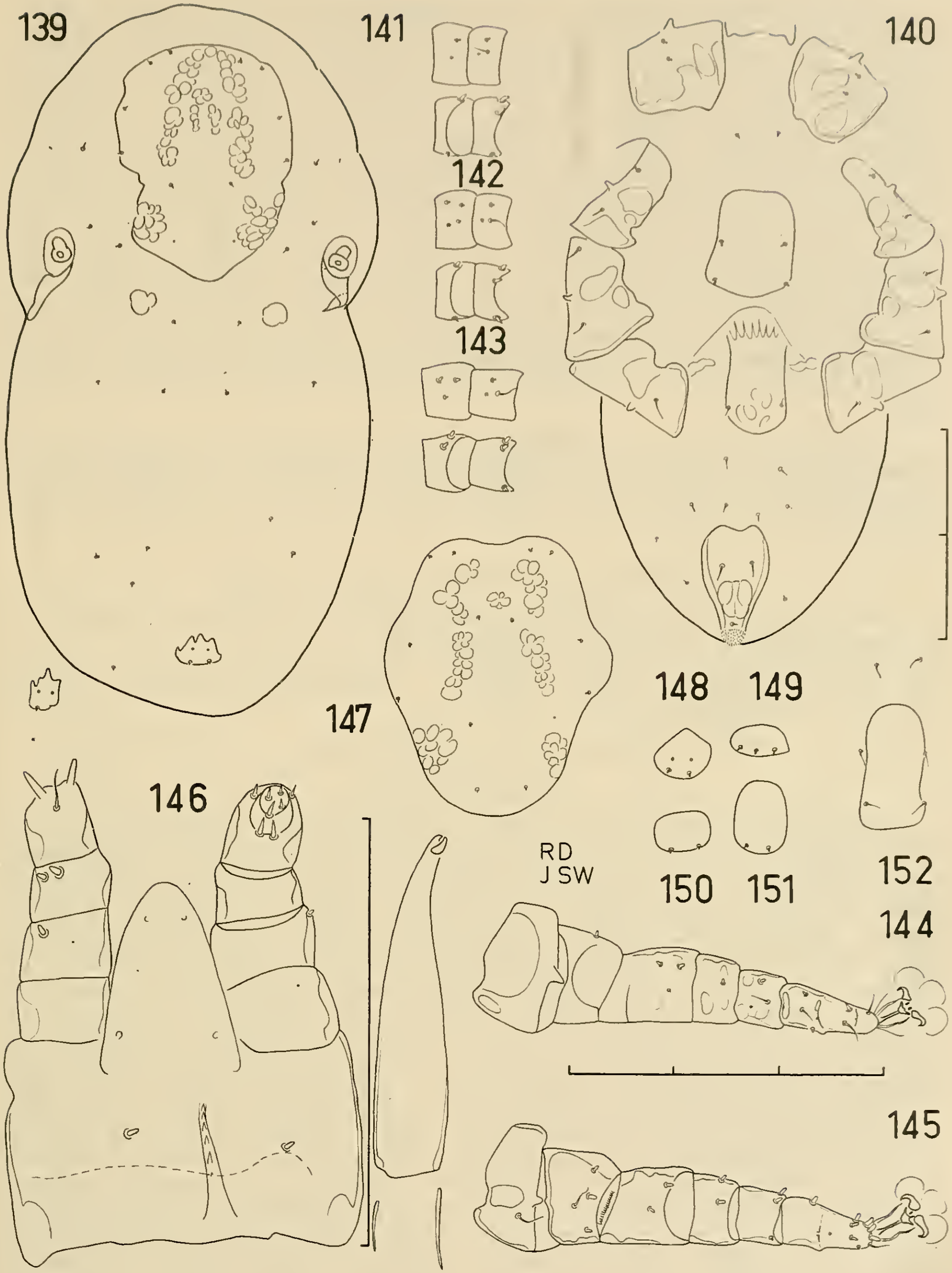
Ptilonyssus terpsiphonei Fain, 1956, *Revue Zool. Bot. afr.*, 53: 145; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 104, 137; 1959, *J. ent. Soc. sth Afr.*, 22: 22; Domrow, 1965, *Acarologia*, 7: 453.

Previous records (all Muscicapidae, Passeriformes).—Black-faced flycatcher, *Monarcha melanopsis* (Vieillot), Esk. Spectacled flycatcher, *M. trivirgata* (Temminck), Mt. Jukes. Also Innisfail. White-eared flycatcher, *Carterornis leucotis* (Gould), Chelona. Also Innisfail.

New host records (all Muscicapidae).—Leaden flycatcher, *Myiagra rubecula* (Latham), Esk, 6.x.1966, R. D. and J. S. W. (6 ♀♀). Restless flycatcher, *Seisura inquieta* (Latham), Esk, 5.i.1966 and 17.iv.1967, R. D., B. H. K., and J. S. W. (4 ♀♀, 3 ♂♂, 1 protonymph). Australian pied flycatcher, *Arses kaupi* Gould, Innisfail, 5.viii.1965, R. D. and J. S. W. (1 ♀). Shining flycatcher, *Piezorhynchus alecto* (Temminck), Innisfail, 3 and 6.viii.1965, R. D. and J. S. W. (8 ♀♀, 4 ♂♂).

Individual variation in this material is considerable, but does not dispel the conviction that only one species is involved. Fain (1957*e*) illustrated three pairs of setae along the midposterior line of the podonotal shield in his African material, and this is also the case in specimens from *M. trivirgata* (Fig. 147). However, in all other Australian material, the anteriormost pair is absent (except in one specimen from *Seisura,* where one seta of the pair is present). Moreover, in specimens from *Myiagra* Vigors and Horsfield, any one or two of the remaining four setae may be rudimentary or absent (Fig. 139). Variation in the pygidial shield is indicated in Figs. 148–151. Distinct poststigmatic shields are always present.

The sternal setae are normally filiform (Fig. 152), but SI are rod-like in material from *Seisura,* and all are so modified in that from *Myiagra* (Fig. 140). The postanal seta is absent in specimens from *M. melanopsis* and *Carterornis* Mathews, minute in those from *Arses* Lesson and *Piezorhynchus* Gould, and otherwise normal.



Figs 139–152. *Ptilonyssus terpsiphonei* Fain.–139–140, Dorsal and ventral views of idiosoma of ♀ from *Myiagra rubecula*, with inset of pygidial shield from another specimen from same host. 141, Dorsal and ventral views of genu-tibia III of ♀ from *M. rubecula*. 142–143, Dorsal and ventral views of genua-tibiae III–IV of ♀ from *Monarcha trivirgata*. 144–145, Dorsal and ventral views of leg IV of ♀ from *M. rubecula*. 146, Ventral view of capitulum (right palp in dorsal view), with inset of chelicera, both from ♀ from *M. rubecula*. 147, Podonotal shield of ♀ from *M. trivirgata*. 148–151, Pygidial shield of ♀♀ from *Seisura inquieta*, *Arses kaupi*. *Piezorhynchus alecto*, and *M. trivirgata*. 152, Sternal shield of ♀ from *Carterornis leucotis*.

The legs present a *mélange* of rod-like and filiform setae (Figs 144–145). Both setae on coxa I are always rod-like, and so is usually the anterior seta on coxa II in material from *Myiagra, Seisura, Piezorhynchus,* and *M. trivirgata* (Fig. 140). Otherwise, the coxal setae are filiform. The major variant in the leg setation occurs on the genua of specimens from both species of *Monarcha* Vigors and Horsfield: I (1–4/2–1), II–III (1–4/0–1), IV (1–3/1–0), compared with I (1–2/2–1), II–III (1–2/0–1), IV (1–1/1–0) in other specimens (Figs 141–143). I include the one specimen from *Arses* in the latter category, although it shows I (1–3/2–1), II (1–2/0–1), III (1–2/1 *av*–1) and (1–2/1 *pv*–1), IV (1–1/1–0) and (1–1/2–0) — indeed, the setation in this specimen varies on the four segments trochanter–tibia. The femoral formulae vary slightly, but this is to be expected on the most setose of the segments. An all-encompassing formula would be 10/9.8/7.5/6.5/6. The remaining segments are constant: coxae 2.2.2.1; trochanters 4.4.4.5; tibiae I–II (1–3/2–1), III–IV (1–3/2–0); tarsi –.18.18.18 (*mv* present, see Fig. 145).

The capitular setae are normally present (Fig. 146), but appear to be absent in material from *M. melanopsis.* The palpal formula (trochanter-genu) is generally 0.2.2 (Fig. 146), but increases to 0.2/3.4 in specimens from *Monarcha* and *Carterornis.*

PTILONYSSUS BRADYPTERI (Fain), n. comb.

Passeronyssus bradypteri Fain, 1962, *Revue Zool. Bot. afr.,* 66: 143; Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 196.

Previous record.—Rufous songlark, *Cinclorhamphus mathewsi* Iredale (Sylviidae, Passeriformes), Esk.

PTILONYSSUS ACROCEPHALI Fain

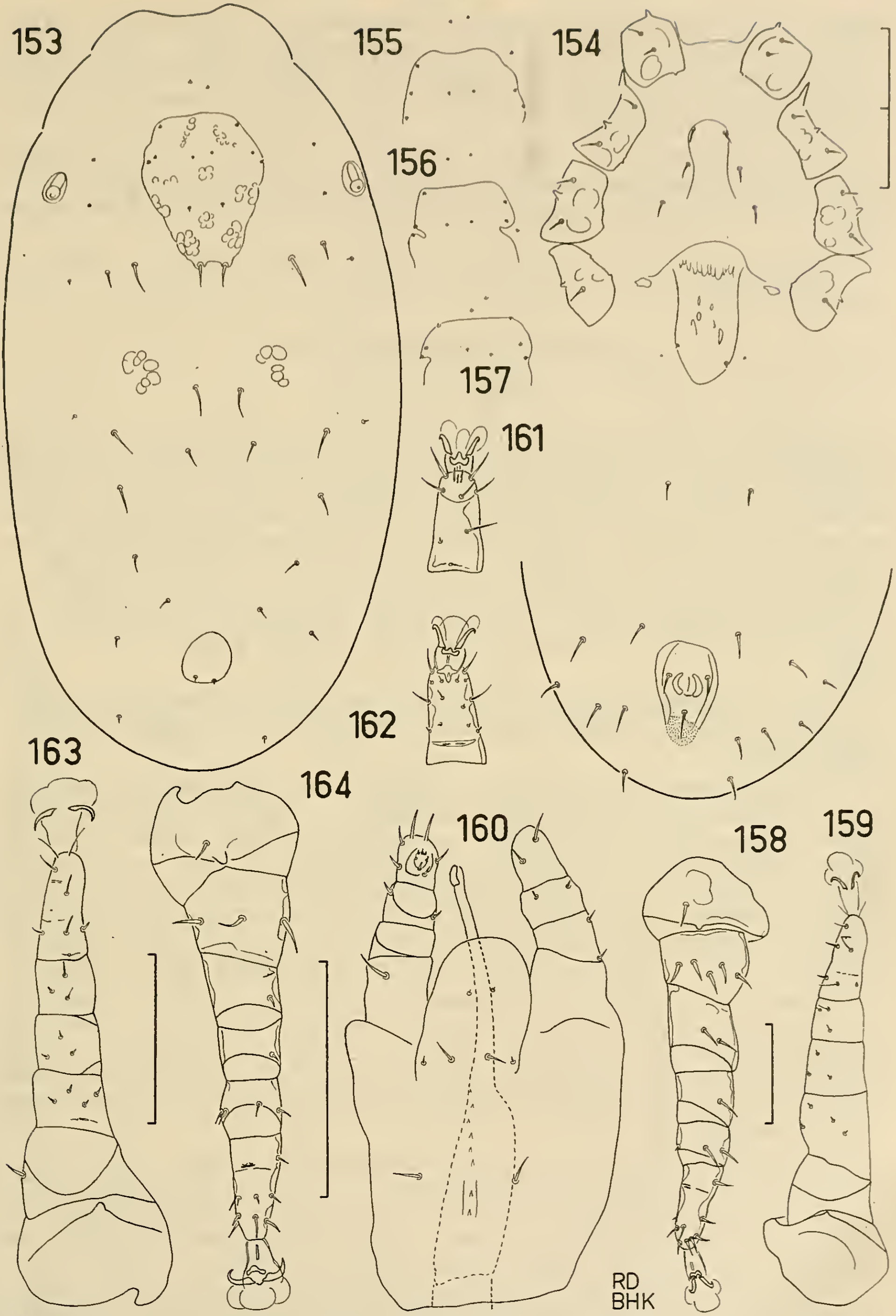
(Figs 153–160)

Ptilonyssus acrocephali Fain, 1964, *Bull. Annls Soc. r. ent. Belg.,* 100: 55.

This species, originally described from a European species of *Acrocephalus* Neumann, may now be recorded from Australia: 5 ♀♀ and 1 protonymph from Australian reed-warblers, *A. australis* (Gould) (Sylviidae, Passeriformes), Esk, 6.x.1966, and Kowanyama, 12.iii.1967, R. D., B. H. K., H. A. S., and J. S. W. The leg chaetotaxy (Figs 158–159) of these specimens is as follows. Coxae 2.2.2.1. Trochanters 4.4.4.5. Femur I (2–4/1–2), II (1–4/1–1), III–IV (1–4/1–0). Genua I–III (1–4/0–1), IV (1–3/0–0). Tibiae I–II (1–3/2–1), III–IV (1–3/2–0). Tarsi –.17.17.17 (*mv* absent). One more, or one less seta was occasionally noted on trochanter IV, femora I–III, and tibia III. The arrangement of setae on the capitulum is shown in Fig. 160.

The genital shield of Australian specimens (Fig. 154) takes in the genital setae as in *P. calamocichlae* Fain (1956, 1957*e*), while these setae are shown as free in Fain's figure of *P. acrocephali.* Moreover, the degree of posterolateral erosion of the podonotal shield (Fig. 153) is such that the subposterior pair of setae is discal, again as in *P. calamocichlae,* rather than marginal as in *P. acrocephali.* The anterolateral margins of the shield are irregular in Australian material (Figs 155–157). Actually, these two taxa are otherwise very similar, and it may be that they are conspecific. At the moment, however, the situation is clouded by several additional taxa recently described from sylviids.

P. calamocichlae Fain (1956, 1957*e*) was originally described from five African genera of Sylviidae: *Calamocichla* Sharpe, *Hippolais* Balderstein, *Cisticola* Kaup, *Prinia* Horsfield, and *Apalis* Swainson. The material from *Hippolais* has since been given subspecific status as *P. c. hippolaisi* by Fain



Figs 153–160. *Ptilonyssus acrocephali* Fain (♀ from *Acrocephalus australis*).–153–154, Dorsal and ventral views of idiosoma. 155-157, Variations in setation of anterior half of podonotal shield. 158–159, Ventral and dorsal views of leg IV. 160, Ventral view of capitulum (left palp in dorsal view).

Figs 161–164. *Ruandanyssus artami*, n. sp (♀ from *Artamus cinereus*).–161–162, Dorsal and ventral views of tarsus I. 163–164, Dorsal and ventral views of leg IV.

(1963*e*), while the material from the remaining three genera had earlier been given specific rank as *P. cisticolarum* by Fain (1959). Finally, the material from *Prinia* and *Apalis,* showing the pygidial shield divided rather than entire as in the three preceding taxa, was given specific rank as *P. elongatus* by Fain (1964*d*).

In the meantime, two further taxa with even more strongly divided pygidial shields were described from Belgian sylviids by Fain (1962*a*, 1963*d*): *P. phylloscopi* from *Phylloscopus* Boie and *P. ruandae sylviae* from *Sylvia* Scopoli.

Material from another Australian sylviid genus (*Gerygone* Gould) is considered below.

PTILONYSSUS MONARCHAE, n. sp.

(Figs 165–170)

Diagnosis.—Of the described species of *Ptilonyssus* from Australian flycatchers, only two species, *P. terpsiphonei* Fain (1956, 1957*e*) and *P. microecae* Domrow (1966*b*), show the podonotal shield complete enough posteriorly to take in the median pair of setae set immediataely in front of the mesonotal shieldlets. This is also true of *P. monarchae,* which may best be compared with *P. microecae.* However, while the anterior process on coxa II is absent, and the postanal seta present in the former, the opposite obtains in the latter. There are also minor differences in the setation of the podonotal shield and the position of the adanal setae relative to the anus.

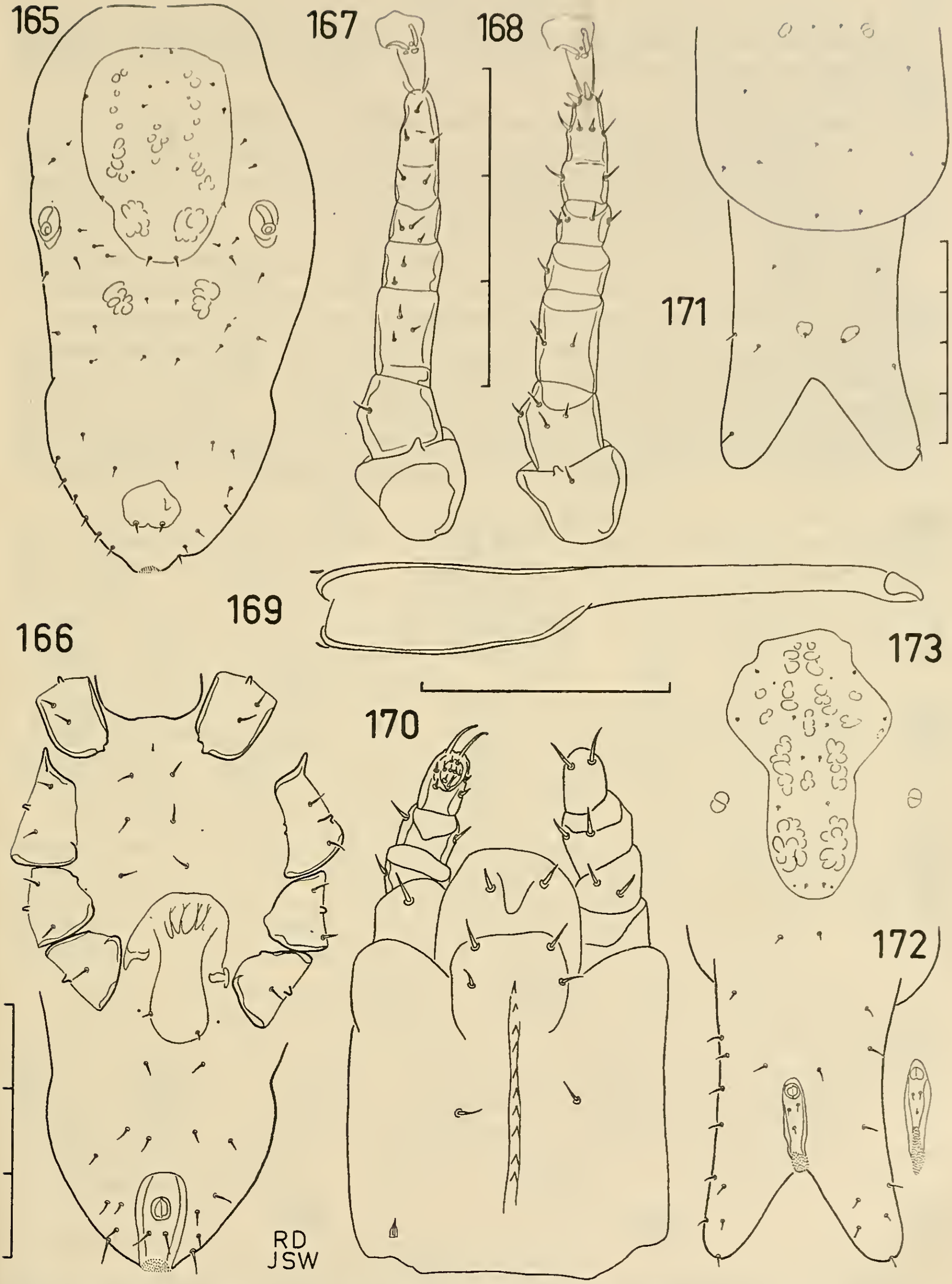
Types.—Holotype female from a spectacled flycatcher, *Monarcha trivirgata* (Temminck) (Muscicapidae, Passeriformes), Innisfail, 31.viii.1965, H. I. McD. Holotype N. I. C.

Female.—Idiosoma 670μ long in unengorged condition, broader in anterior half. Podonotal shield (Fig. 165) half again as long as wide, 256 × 178μ, narrower in posterior third; anterior margin subrectilinear, posterior margin convex; with muscle insertions and seven pairs of setae as indicated. Peritremes short, borne on oval shieldlets with poststigmatic portions more heavily sclerotized. Body cuticle between and around podonotal shield and peritremes with 13 setae. Mesonotum with two shieldlets and transverse band of ten setae. Pygidium with entire shield and eight pairs of setae.

Sternal shield (Fig. 166) evanescent, with six setae, but apparently without pores. Metasternal setae absent. Genital shield drop-shaped, with rayed operculum and two genital setae, the latter accompanied by pores in adjacent cuticle. Anal shield elongate, with anus in front of adanal setae; postanal seta absent, but cribrum present. Body cuticle with fifteen setae arranged 2.5.8.

Coxa II with slender process on anterodorsal margin. Coxae 2.2.2.1. Trochanters I–II (1–0/2–1), III (2–0/2–0), IV (1–1/3–0). Femur I (2–4/1–2), II (1–4/1–1), III (1–3/1–0), IV (1–3/2–0). Genua I–III (1–4/0–1), IV (1–2/0–0). Tibiae (1–3/2–1). Tarsi –.17.17.17 (*mv* absent; I with one ventrodistal seta stronger, II–IV with av_1 and pv_1 stronger, see Figs 167–168).

Basis capituli with two, and hypostome with six setae; HII smaller, remainder subequal (Fig. 170). Deutosternum with single file of ten denticles. Palpal setal formula 1.3.4.8. Tarsus with about seven minute setae and bifid claw. Chelicerae (Fig. 169) attenuate for slightly more than half their length; digits occupying one-fifteenth of total length. Minute tritosternal remnant present.



Figs 165–170. *Ptilonyssus gliciphilae* Domrow (♀ from *Myzomela pectoralis*).–165–166, Dorsal and ventral views of idiosoma. 167–168, Dorsal and ventral views of leg IV. 169, Chelicera. 170, Ventral view of capitulum with inset showing tritosternum (left palp in dorsal view).

Figs 171–173. *Ptilonyssus gliciphilae* Domrow (♀ from *Myzomela pectoralis*).–171–172, Dorsal and ventral views of opisthosoma. 173, Podonotal shield.

PTILONYSSUS SETOSAE, n. sp.
(Figs 174–186)

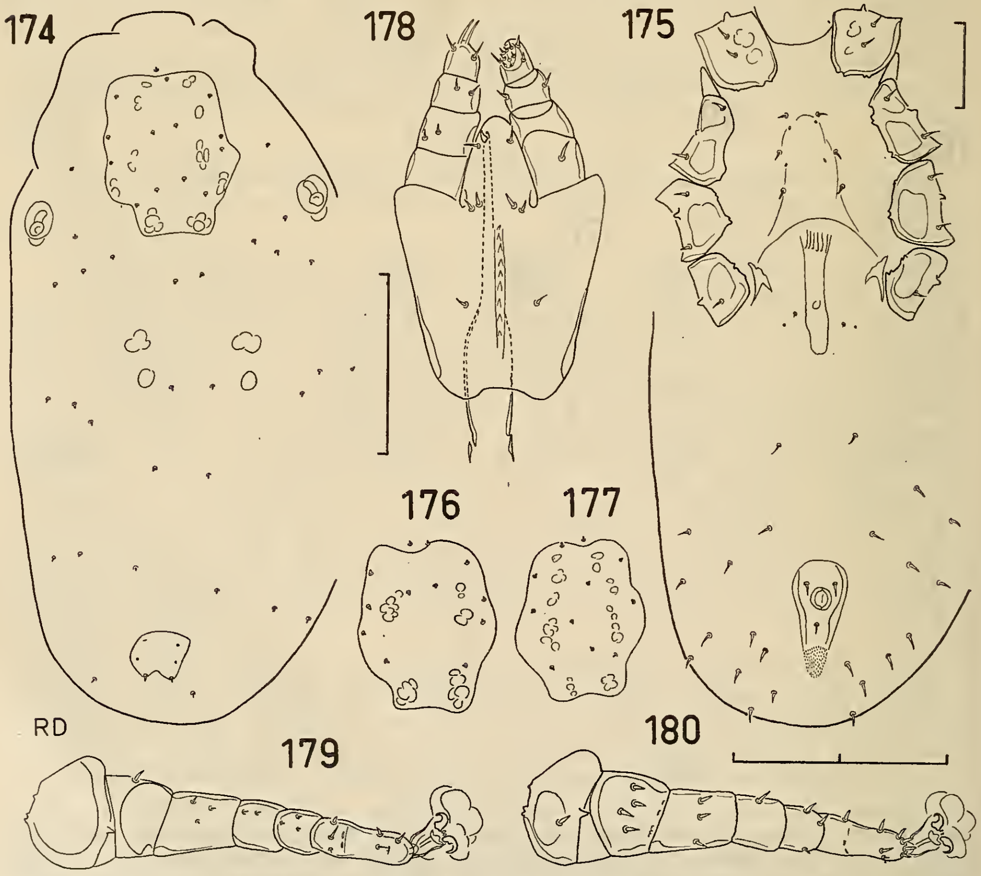
Diagnosis.—The species of *Ptilonyssus* known from *Rhipidura* Vigors and Horsfield (see Fain, 1963*e*, and Domrow, 1966*b*) may be separated by the following couplets:

1. Vertical setae present, *i.e.* podonotal shield with seven pairs of setae. Postanal seta present 2
Vertical setae absent, *i.e.* podonotal shield with six pairs of setae (including submarginal anterolateral pair). Postanal seta absent .... *macclurei* Fain
2 (1). Pygidial shield entire. Adanal setae in front of anus .... *setosae*, n. sp.
Pygidial shield divided. Adanal setae behind anus .... *rhipidurae* Domrow

Types.—Holotype female and seven paratype females from a northern fantail, *Rhipidura setosa* (Quoy and Gaimard) (Muscicapidae, Passeriformes), Ella Bay, 4.viii.1965, R. D. and J. S. W. Holotype N. I. C.; paratypes R. D.

The following specimens are assigned to the new species, but do not form part of the type series: 6 ♀ ♀ and 1 protonymph from rufous fantails, *R. rufifrons* (Latham), Innisfail, 24 and 29.vi.1965, G. J. B. and H. I. McD.

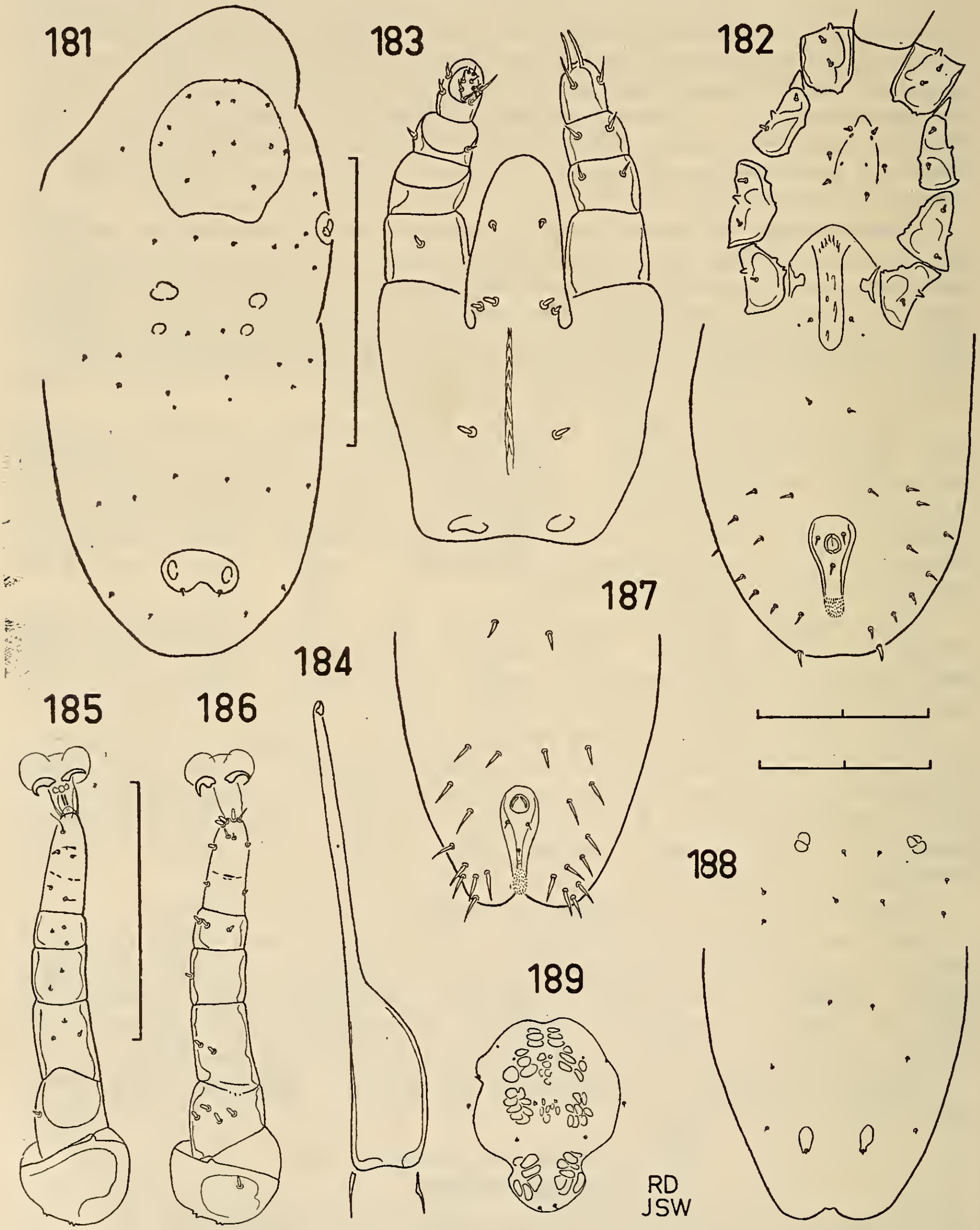
Female.—Idiosoma 594–616μ long, 322μ wide in unfed specimens, and up to 814–880μ long, 385–418μ wide in engorged material (all mounted).



Figs 174–180. *Ptilonyssus setosae*, n. sp. (♀ from *Rhipidura setosa*).–174–175, Dorsal and ventral views of idiosoma. 176–177, Variations in setation of podonotal shield. 178, Ventral view of capitulum (right palp in dorsal view). 179–180, Dorsal and ventral views of leg IV.

[illegible]

considerably enlarged in *P. c. hippolaisi*. Also, on the posterior tarsi, the setae on the leading edge are retrorse, and av_1 and pv_1 divergent in *P. c. hippolaisi*, but normally curved and with opposed tips, respectively, in the new species. Finally, the bulbous basal portion of the chelicerae is relatively longer in *P. c. hippolaisi* with respect to the attenuate distal portion.

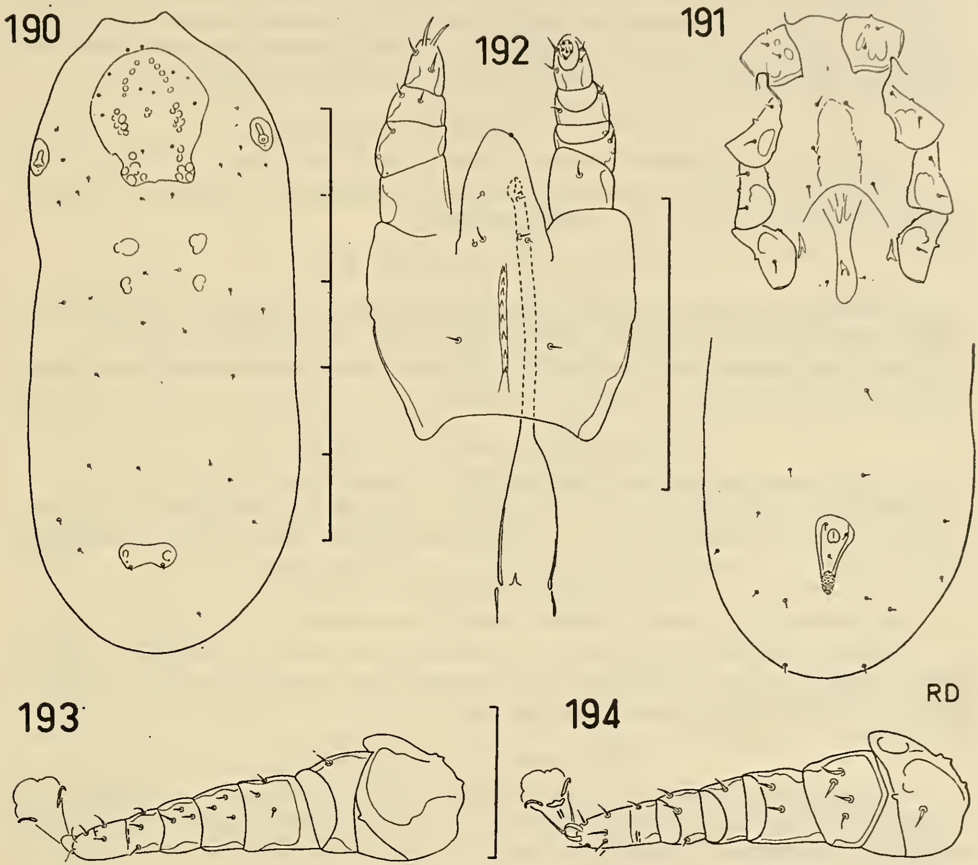


Figs 181–186. *Ptilonyssus setosae*, n. sp. (♀ from *Rhipidura rufifrons*).–181–182, Dorsal and ventral views of idiosoma. 183, Ventral view of capitulum (left palp in dorsal view). 184, Chelicera. 185–186, Dorsal and ventral views of leg IV.

Figs 187–189. *Ptilonyssus philemoni* Domrow (♀ from *Meliphaga notata*).–187–188, Ventral and dorsal views of opisthosoma. 189, Podonotal shield.

Types.—Holotype female, six paratype females, and one protonymph from black-throated warblers, *Gerygone palpebrosa* Wallace (Sylviidae, Passeriformes), Innisfail, 1.vii. and 16.viii.1965, G. J. B., R. D., H. I. McD., and J. S. W. Holotype N. I. C.; paratypes R. D.

Female.—Idiosoma 704–836μ long, 253–319μ wide depending on degree of engorgement. Podonotal shield (Fig. 190) 150–161μ long, 138–147μ wide; broadly arched anterolaterally, irregularly bilobed posteriorly; bearing six pairs of setae (including vertical pair); surface weakly granulate and marked by muscle insertions. One pair of setae immediately behind shield, and five pairs arranged 1.1.3 between shield and peritrematalia. Mesonotum with usual four shieldlets and transverse band of ten setae. Pygidial shield entire, transverse, with two setae and pores; surrounded by about eight setae. All dorsal setae in form of slender spines.



Figs 190–194. *Ptilonyssus gerygonae*, n. sp. (♀ from *Gerygone palpebrosa*).–190–191, Dorsal and ventral views of idiosoma. 192, Ventral view of capitulum (right palp in dorsal view) (note tritosternum). 193–194, Dorsal and ventral views of leg IV.

Sternal shield weakly outlined and textureless, with two pores; SI–III in adjacent cuticle (Fig. 191). Metasternal setae absent. Genital shield narrowly drop-shaped, leaving genital setae and attendant pores free in cuticle. Anal shield small, elongate, with adanal setae in front of, and postanal seta behind anus; cribrum present. Ventral cuticle with about six pairs of setae.

Legs with slender, spine-like setae ventrally (Figs 193–194). Coxae 2.2.2.1. Trochanters 4.4.4.5. Femur I (2–4/1–2), II (1–4/1–1), III (1–3/0–0), IV (1–3/1–0). Genua I–III (1–4/0–1), IV (1–3/0–0). Tibiae I–II (1–3/2–1), III–IV (1–3/2–0). Tarsi –.17.17.17 (*mv* absent; av_1 and pv_1 stronger, with opposed points).

Capitular setae and all hypostomal setae present (Fig. 192). Deutosternum with about eight denticles in single file. Palpal setal formula 1.2(3).4.8. Chelicerae bulbous in basal two-fifths, with chelate portion occupying one-twentieth of total length. Minute tritosternal remnant present.

Ptilonyssus rhipidurae Domrow

Ptilonyssus rhipidurae Domrow, 1966, Proc. Linn. Soc. N.S.W., 90: 199.

Previous record.—Grey fantail, *Rhipidura fuliginosa* (Sparrman) (Muscicapidae, Passeriformes), Esk. Also Innisfail.

Ptilonyssus macclurei Fain

Ptilonyssus macclurei Fain, 1963, *Revue Zool. Bot. afr.,* 68: 72; Domrow, 1964, *Acarologia,* 6: 609, 617; 1966, Proc. Linn. Soc. N.S.W., 90: 201.

Previous record.—Willie wagtail, *Rhipidura leucophrys* (Latham) (Muscicapidae, Passeriformes), Palen Ck., Brisbane, and Esk. Also Kowanyama.

Ptilonyssus psophodae Domrow

Ptilonyssus psophodae Domrow, 1964, *Acarologia,* 6: 29, 618.

Previous record.—Eastern whipbird, *Psophodes olivaceus* (Latham) (Falcunculidae, Passeriformes), Upper Brookfield. Also Esk and Innisfail.

Ptilonyssus grallinae Domrow

Ptilonyssus grallinae Domrow, 1964, *Acarologia,* 6: 611, 618.

Previous record.—Magpie-lark, *Grallina cyanoleuca* (Latham) (Grallinidae, Passeriformes), Brisbane and Condamine. Also Urbenville (N.S.W.), Esk, Charleville, Chelona and Kowanyama.

Ptilonyssus ruandae Fain

Ptilonyssus ruandae Fain, 1956, *Revue Zool. Bot. afr.,* 53: 395; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 109; Domrow, 1964, *Acarologia,* 6: 608. *Ptilonyssus ruandae alcippei* Fain and Nadchatram, 1962, *Bull. Annls Soc. r. ent. Belg.,* 98: 279.

Previous record.—Grey-backed silvereye, *Zosterops lateralis* (Latham) (Zosteropidae, Passeriformes), Brisbane. Also Wilson's Peak, Mt Jukes, and Innisfail.

Ptilonyssus dicaei Domrow

Ptilonyssus dicaei Domrow, 1966, Proc. Linn. Soc. N.S.W., 90: 201.

Previous record.—Mistletoe-bird, *Dicaeum hirundinaceum* (Shaw) (Dicaeidae, Passeriformes), Mt Jukes.

Ptilonyssus cinnyris Zumpt and Till

(Fig. 81)

Ptilonyssus cinnyris Zumpt and Till, 1955, *J. ent. Soc. sth. Afr.,* 18: 78; Fain, 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 86; 1958, *Bull. Soc. r. Zool. Anvers* 9: 7; Nadchatram, McClure, and Lim, 1964, *J. fed. Malay St. Mus.,* 9: 104.

This parasite of African and Malayan sunbirds may now be recorded from the only Australian member of the family: 3 ♀♀ and 1 protonymph from yellow-breasted sunbirds, *Cyrtostomus frenatus* (Müller) (Nectariniidae, Passeriformes), Innisfail, 2.viii and 17.ix.1965, R. D., H. I. McD., and J. S. W. The podonotum is shown in Fig. 81.

PTILONYSSUS MYZANTHAE Domrow

Ptilonyssus myzanthae Domrow, 1964, *Acarologia,* 6: 603, 617.

Previous records (both Meliphagidae, Passeriformes).—Noisy miner, *Myzantha melanocephala* (Latham), Condamine. Also Esk. Little wattle-bird, *Anthochaera chrysoptera* (Latham), Palen Ck.

New host record.—Yellow-throated miner, *M. flavigula* Gould, Charleville, 19.i.1967, J. N. and J. S. W. (5 ♀♀, 1 protonymph); Winbin Ck., 20.i.1966, R. D., D. J. M., and J. S. W. (2 ♀♀).

PTILONYSSUS PHILEMONI Domrow
(Figs 187–189)

Ptilonyssus philemoni Domrow, 1964, *Acarologia,* 6: 600, 617; 1965, *Ibid.,* 7: 460.

Previous records (all Meliphagidae, Passeriformes).—Blue-faced honeyeater, *Entomyzon cyanotis* (Latham), Logan Village and Condamine. Also Esk and Kowanyama. Noisy friar-bird, *Philemon corniculatus* (Latham), Logan Village. Also Palen Ck., Esk, Charleville, and Mt Jukes. Little friar-bird, *P. citreogularis* (Gould), Brisbane, Samford, and Esk. Also Charleville, Chelona, Longreach Lagoon, and Kowanyama.

New host records (all Meliphagidae).—Striped honeyeater, *Plectorhyncha lanceolata* Gould, Esk, 10.vii.1967, R. D. and B. H. K. (11 ♀♀, 4 nymphs); Charleville-Cunnamulla road, 19.v.1965, H. A. S., D. J. M., and B. H. K. (3 ♀♀). Lesser Lewin honeyeater, *Meliphaga notata* (Gould), Innisfail, 3 and 22.vi, and 15.ix.1965 (17 ♀♀, 1 ♂). Graceful honeyeater, *M. gracilis* (Gould), Innisfail, 30.vi, 5–21.viii, and 14.ix.1965, G. J. B., R. D., H. I. McD., and J. S. W. (27 ♀♀).

The new specimens from *Plectorhyncha* Gould are quite typical of the original description, although in one specimen the pygidial shield shows far to one side a very narrow longitudinal fissure with striate cuticle, and may fairly be said to be divided.

However, the specimens from *Meliphaga* Lewin, although they show the same evenly tapering chelicerae and cordate podonotal shield with 5–6 characteristically arranged pairs of setae figured for *P. philemoni* Domrow (1964*c*), may be separated by the following features: (*i*) the adanal setae are set well behind the anus; and (*ii*) the pygidial shield is divided, the two longitudinal fragments being widely separated. Other minor differences are detailed in the description below.

Female.—Idiosoma 583–660μ long when unengorged, but up to 825–990μ when fully fed and mounted; weakly cleft posteriorly. Podonotal shield (Fig. 189) usually 220–231μ long, 170–176μ wide, but occasionally smaller (209–214μ long, 165–168μ wide); cordate, but margins somewhat eroded, leaving one or two of three anterolateral pairs of setae free in cuticle; two discal pairs set in stronger arch than in original series; posterior pair submarginal. Surface irregularly granulate, with very distinct muscle insertions. Cuticle between narrowed posterior third of shield and peritremes with three pairs of setae. Two mesonotal shieldlets accompanied by eight setae arranged 4.4. Halves of pygidial shield (Fig. 188) elongate, widely separated, each with terminal seta; preceded by arch of six setae.

Sternal shield somewhat stronger than in original series, with some granulation, usually bearing SI and II submarginally, and with two pores between SII; SI not as strong as pygidial setae, SII larger, and SIII approaching anteroventral opisthosomal setae in size. Metasternal setae absent. Genital shield typical. Anal shield (Fig. 187) elongate, 140–162μ long, 40–46μ wide; anus well forward, and well in front of three subequal and weak anal setae. Ventral body cuticle with nine to 14 (usually 10–12) pairs of stout setae.

Setae on coxae and trochanters slightly more expanded than in original series; those on ventral surface of other segments (including av_1 and pv_1 on tarsi II–IV) somewhat weaker, but still with delicate tips. Setae on dorsum of legs weaker, evenly tapering. Coxae 2.2.2.1. Trochanters I–II (1–0/2–1), III (2–0/2–0), IV (2–0/4–0). Femur I (2–4/1–2), II (1–4/2–1), III–IV (1–3/1–0). Genua I–II (1–4/0–1), III (1–4/0–2), IV (1–3/1–0). Tibiae (1–3/2–1). Tarsi –.17.17.17 (*mv* absent). The formulae of the original series differ in the following respects: trochanter IV with five setae; basifemur I often with tenth seta ventrally; femur III with four to six setae; genua III–IV usually (1–4/0–1) (1–3/0–0), but (1–4/0–2) (1–3/1–0) in large specimens from *P. corniculatus*.

Capitulum as in original series except as follows: basis without spinulae at ventroexternal angles; hypostomal setae very weak, anteriormost pair absent. Palpal setal formula 1.2.4.8 in both series.

Male.—Idiosoma 473μ long. Dorsum as in female.

Venter essentially as in female, except for genital aperture in front of SI (area between coxae IV not clear). Anal shield 135 × 40μ, flanked by five stout setae on one side and six on other.

Legs and capitulum undistinguished.

PTILONYSSUS BALIMOENSIS Sakakibara

(Figs 195–203)

Ptilonyssus balimoensis Sakakibara, 1968, *J. med. Ent.,* 5: 17.

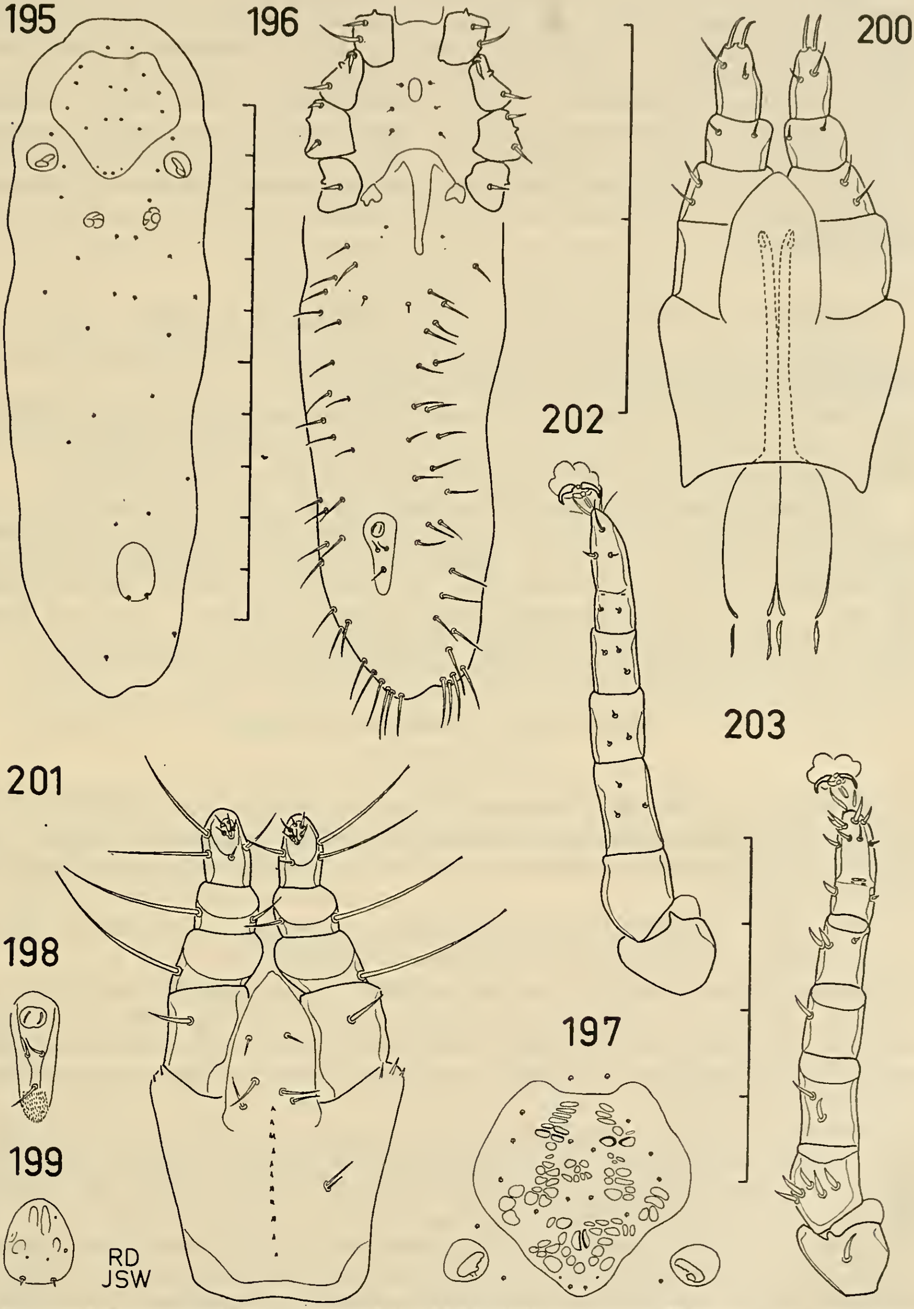
I had already figured and described this striking new species before seeing the above reference, and therefore restrict the present text to additional descriptive notes and figures. The podonotal shield immediately recalls that of *P. philemoni* Domrow (1964*c*), but the two species may easily be separated by the shape of the cheliceral shafts, and the setation of the ventral face of both opisthosoma and palpi.

The new material comprises 2 ♀♀ from a Macleay honeyeater, *Meliphaga macleayana* (Ramsay) (Meliphagidae, Passeriformes), Ella Bay, Innisfail, 12.viii.1965, R. D. and J. S. W.

Female.— Idiosoma (Figs 195–196) 1300μ long in slightly compressed material. Podonotal shield (Fig. 197) broadly cordate, as long as wide; shagreened over entire surface (except for narrow marginal strip), showing quite strongly marked muscle insertions, and bearing two subposterior pores and seven pairs of setae. Pygidial shield (Fig. 199) longitudinally shagreened (particularly in mid-line), bearing four or five pores and two spinose pygidial setae. All dorsal setae minute, particularly on podosoma.

Sternal shield without pores. Genital shield longitudinally shagreened, with indications of muscle insertions. Anal shield (Fig. 198) shagreened laterally. Ventral cuticle with 26–31 setae on either side, all of which are very strong except one midanterior pair.

Coxa II without anterodorsal process, but anterior seta borne on tubercle. Setae on ventral aspect of legs considerably longer and stronger than those on dorsal, occasionally bifid at extreme tip (Figs 202–203). Coxae 2.2.2.1. Trochanters I-II (1–0/2–1), III (2–0/2–0), IV (2–0/3–0). Femur I (2–4/3–2) (including one seta present ventrally on basifemur), II (1–4/2–1), III (1–4/1–0), IV (1–3/1–0). Genua I–III (1–4/0–1) (but II with only 3 *d* once), IV (1–3/0–0). Tibiae I–II (1–3/2–1), III (1–3/2–0) in one specimen



Figs 195–203. *Ptilonyssus balimoensis* Sakakibara (♀ from *Meliphaga macleayana*).– 195–196, Dorsal and ventral views of idiosoma. 197, Podonotal shield. 198, Anal shield. 199, Pygidial shield. 200–201, Dorsal and ventral views of capitulum. 202–203, Dorsal and ventral views of leg IV.

(1–3/1 *av*–0) in other, IV (1–3/2–0) (but with only 1 *v*, and that *av*, once). Tarsi–.17.17.17 (*mv* absent; av_1 and pv_1 stronger on tarsi II–IV). Ambulacrum I little different from II–IV, all with two subequal claws and diaphanous pulvillus.

Basis capituli (Figs 200–201) slightly teratological in both specimens, showing two setae set in contiguous or single alveolus on left side only, rather than typical 1.1; spinulose externally near trochanteral articulation. Tritosternum absent, but deutosternal groove present, showing about eleven uni- or bidentate denticles. Palpi five-segmented, with setal formula 1.3.4(5).8(7); four external setae on femur-tibia preternaturally long for genus, sometimes bifid at extreme tip. Tarsus weak, completely obscured dorsally by tibia; with about five weak setae and small bifid claw. Chelicerae suddenly attenuate in distal half; chelate portion occupying one-twentyfifth of total length.

Ptilonyssus myzomelae Domrow

Ptilonyssus myzomelae Domrow, 1965, *Acarologia*, 7: 455.

Previous record.—Scarlet honeyeater, *Myzomela sanguinolenta* (Latham) (Meliphagidae, Passeriformes), Samford. Also Esk.

New host record.—Dusky honeyeater, *M. obscura* Gould, Innisfail, 30.vi, 6.viii, and 30.ix.1965, G. J. B., R. D., H. I. McD., and J. S. W. (3 ♀ ♀, 1 deutonymph); Jordan Ck., 18.viii.1965, R. D. (2 ♀ ♀, 1 protonymph).

Specimens from the type host, *M. sanguinolenta,* show the pygidial shield completely lacking, although the short, stumpy pygidial setae (and their accompanying pores) are easily made out among the elongate, tapering opisthosomal series. Specimens from *M. obscura,* however, show widely separated, small, rounded pygidial shields, each bearing a seta and pore, although on one side of one specimen the pygidial seta is separated from its shield and pore by five complete cuticular annulations.

Ptilonyssus gliciphilae Domrow

(Figs 171–173)

Ptilonyssus gliciphilae Domrow, 1966, Proc. Linn. Soc. N.S.W., 90: 204.

Previous record.—Brown honeyeater, *Gliciphila indistincta* (Vigors and Horsfield) (Meliphagidae, Passeriformes), Esk and Chelona. Also Charleville and Kowanyama.

New host record.—Banded honeyeater, *Myzomela pectoralis* Gould (Meliphagidae), Kowanyama, 16, 18, and 23.x.1965, R. D. (11 ♀ ♀, 1 ♂).

The podonotal shield of the new material is very similar to that of the original. However, apart from host-specificity, the new form is readily separable by showing the pygidial shield distinctly divided, and two setae ventrally on basifemur I. Further minor differences are noted in the description below.

Female.—Idiosoma 780μ long in one unengorged specimen, but elongate and reaching 1320–1430μ in fully fed, mounted material; terminal bifurcation quite evident in life, even to naked eye. Podonotal shield (Fig. 173) usually 290–308μ long and 187–192μ wide, but extreme range 286–319μ long and 176–205μ wide; more parallel-sided in posterior half, and with anteriormost pair of median setae set further back than in original series; surface strongly granulate, with well-defined muscle insertions. Arrangement of adjacent setae and shieldlets around podonotal shield and on mesonotum as in original series. Halves of pygidial shield (Fig. 171) small, well separated, each with seta and pore; flanked by three or four pairs of stronger setae.

Venter as in original series, but anal shield (Fig. 172) narrower (220–253μ long, 52–55μ wide) and less well-defined anteriorly. Genital shield on raised lobe between coxae IV in engorged specimens.

Coxae 2.2.2.1. Trochanters I–II (1–0/2–1), III (2–0/2–0), IV (2–1/2–0). Femur I (2–4/3–2) (including two setae ventrally on basifemur), II (1–4/2–1), III (1–3/2–0), IV (1–3/1–0). Genu I (1–4/0–1), II (1–4/1–1), III (1–4/1–2), IV (1–3/1–0). Tibiae (1–3/2–1). Tarsi –.17.17.17 (*mv* absent; av_1 and pv_1 as in original series). The original series shows a similar chaetotaxy, except femur I (1–4/1–2) (*i.e.* no setae ventrally on basifemur), III (1–3/1–0); genu III (1–4/1–1). Setae on ventral face of legs similar to those on coxae, but those on dorsum rather weaker. Ambulacrum I only very slightly weaker than II–IV. Coxa II with strong anterodorsal process.

Capitulum as in original series, but setal formula of palpi 1.3(2).4.9 due to presence of additional seta dorsally on femur and tibia. Tritosternum absent.

Male.—Idiosoma 596μ long, evenly rounded posteriorly. Dorsum entirely as in female, but podonotal shield smaller, 219 × 120μ.

Sternal shield as in female, but extended into diffuse genital area between coxae IV; genital setae free in cuticle. Sexual aperture in front of SI. Anal shield as in female, but only 120μ long; surrounded by five pairs of setae rather than 10–12 pairs in female.

Leg setation as in female, but with five setae on one trochanter II; av_1 and pv_1 on tarsi II–IV sharply pointed, though still upturned at tip.

Capitulum as in female. Chelicerae not attenuate, spermatodactyl occupying two-fifths of total length of 120μ.

Ptilonyssus lymozemae Domrow

Ptilonyssus lymozemae Domrow, 1965, *Acarologia*, 7: 453.

Previous record.—Scarlet honeyeater, *Myzomela sanguinolenta* (Latham) (Meliphagidae, Passeriformes), Logan Village and Samford. Also Esk.

Ptilonyssus stomioperae Domrow

Ptilonyssus stomioperae Domrow, 1966, Proc. Linn. Soc. N.S.W., 90: 206.

Previous records (both Meliphagidae, Passeriformes).—Yellow honeyeater, *Meliphaga flava* (Gould), Kowanyama. White-gaped honeyeater, *Stomiopera unicolor* (Gould) Kowanyama.

Ptilonyssus thymanzae Domrow

Ptilonyssus thymanzae Domrow, 1964, *Acarologia*, 6: 604, 617; 1966, Proc. Linn. Soc. N.S.W., 90: 204.

Previous records (all Meliphagidae, Passeriformes).—Lewin honeyeater, *Meliphaga lewinii* Swainson, Esk. Also Wilson's Peak and Innisfail. Lesser Lewin honeyeater, *M. notata* (Gould), Innisfail. Yellow-faced honeyeater, *M. chrysops* (Latham), Samford. Noisy miner, *Myzantha melanocephala* (Latham), Logan Village and Condamine. Also Brisbane and Esk. Little wattle-bird, *Anthochaera chrysoptera* (Latham), Palen Creek.

New host records (all Meliphagidae).—White-plumed honeyeater, *Meliphaga penicillata* Gould, Charleville, 10 and 24.i.1967, R. D., J. N., and J. S. W. (4 ♀ ♀); Winbin Ck., 21.i.1966, R. D., D. J. M., and J. S. W. (2 ♀ ♀). Yellow-throated miner, *Myzantha flavigula* Gould, Winbin Ck., 20.i.1966, R. D., D. J. M., and J. S. W. (2 ♀ ♀). Spiny-cheeked honeyeater, *Acanthagenys rufogularis* Gould, Charleville, 14.i.1966 and 1.ii.1967, R. D., D. J. M., and J. S. W. (2 ♀ ♀).

PTILONYSSUS MELIPHAGAE Domrow

Ptilonyssus meliphagae Domrow, 1964, *Acarologia,* 6: 606.

Previous record.—Yellow-faced honeyeater, *Meliphaga chrysops* (Latham) (Meliphagidae, Passeriformes), Mt Cotton. Also Esk.

New host record.—White-throated honeyeater, *Melithreptus albogularis* Gould (Meliphagidae), Esk, 6.x.1966 and 17.iv.1967, R. D., B. H. K., and J. S. W. (4 ♀ ♀); Kowanyama, 15.iii.1966, R. D. (1 ♀).

The pygidial complex of the original specimen from *Meliphaga* was not detected, but I have since seen two more females from this host. These show the pygidial shield widely divided into two elongate fragments little wider than the alveoli of the pygidial setae. A pore accompanies each seta.

The specimens from *Melithreptus* Vieillot all show an entire, transverse pygidial shield, although in two specimens it is narrowly and asymmetrically divided as in the specimen of *P. philemoni* discussed above. Indeed, in one specimen, the teratology affects the entire distal portion of the opisthosoma, as ventrally the anal shield is also atypical, lacking the postanal seta.

PTILONYSSUS NUDUS Berlese and Trouessart

Ptilonyssus nudus Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest,* 2: 130; Berlese, 1892, "Acari, myriapoda, et scorpiones hucusque in Italia reperta, ordo Mesostigmata" (Patavii), fasc. 53, No. 10 (♀); de Castro and Pereira, 1947, *Archos Inst. biol., S Paulo,* 18: 127; Bregetova, 1951, *Parazit. Sb.,* 13: 118; Porter and Strandtmann, 1952, *Tex. J. Sci.,* 4: 394; George, 1961, *J. Kans. ent. Soc.,* 34: 116; Fain, 1963, *Bull. Annls Soc. r. ent. Belg.,* 99: 171; *nec* Hirst, 1916, *J. zool. Res.,* 1: 73. *Ptilonyssus* (*Ptilonyssus*) *nudus,* de Castro, 1948, *Archos Inst. biol., S Paulo,* 18: 260.

Previous records (both Fringillidae, Passeriformes).—Tree-sparrow (introduced), *Passer montanus* (Linnaeus). House-sparrow (introduced), *P. domesticus* (Linnaeus).

I have been able to examine specimens of this species from Europe and the United States.

PTILONYSSUS STURNOPASTORIS Fain

(Figs 204–213)

Ptilonyssus sturnopastoris Fain, 1963, *Acarologia,* 5: 1.

This species, originally described from an Indian starling (*Sturnopastor* Blyth), may now be recorded as follows: 2 ♀ ♀ and 2 protonymphs from Australian shining starlings, *Aplonis metallica* (Temminck) (Sturnidae, Passeriformes), Ella Bay, 4.viii.1965, R. D. and J. S. W.

PTILONYSSUS SPHECOTHERIS Domrow

Ptilonyssus sphecotheris Domrow, 1964, *Acarologia,* 6: 613.

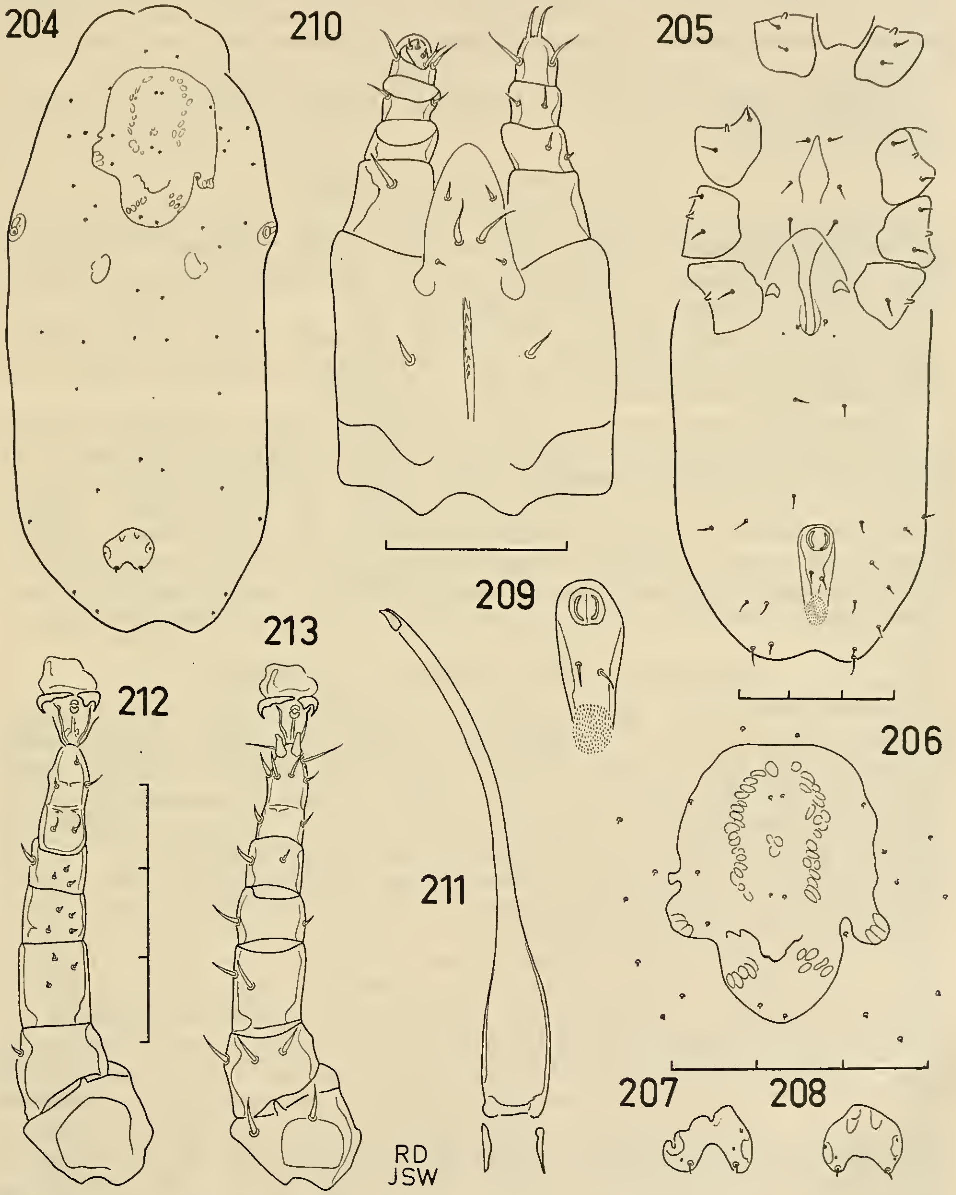
Previous record.—Southern figbird, *Sphecotheres vieillotii* Vigors and Horsfield (Oriolidae, Passeriformes), Brisbane. Also Samford.

New host records.—Yellow figbird, *S. flaviventris* Gould, Ella Bay, 4.viii.1965, R. D. and J. S. W. (41 ♀ ♀, 6 ♂ ♂, 1 deuto-, and 1 protonymph). Great bower-bird, *Chlamydera nuchalis* (Jardine and Selby) (Ptilonorhynchidae, Passeriformes), Kowanyama 18.iii.1966, R. D. (1 ♀).

I have not been able to distinguish the lattermost specimen from paratypes of this species. Its presence in a ptilonorhynchid rather than the usual oriolid is not due to any error of labelling, either in the field or the laboratory. As with the single specimens above of *P. cractici* from *Dacelo* and *R. rhinolethrum* from *Tringa,* I was quite aware at the time of collection that a novelty had been obtained.

Ptilonyssus trouessarti (Hirst)

Rhinonyssoides trouessarti Hirst, 1921, *Proc. zool. Soc. Lond.*, 1921: 770. *Ptilonyssus trouessarti,* Fain and Hyland, 1962, *Ann. Mag. nat. Hist.*, (13) 5: 346; Domrow, 1964, *Acarologia*, 6: 608. *Ptilonyssus orioli* Fain, 1956, *Revue Zool. Bot. afr.*, 53: 144; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 114; 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 264; Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 150.



Figs 204–213. *Ptilonyssus sturnopastoris* Fain (♀ from *Aplonis metallica*).–204–205, Dorsal and ventral views of idiosoma. 206, Podonotal shield. 207–208, Variations in pygidial shield. 209, Anal shield. 210, Ventral view of capitulum (left palp in dorsal view). 211, Chelicera. 212–213, Dorsal and ventral views of leg III.

Previous records (both Oriolidae, Passeriformes).—Olive-backed oriole, *Oriolus sagittatus* (Latham), Logan Village. Also Esk and Innisfail. Yellow oriole, *O. flavocinctus* (King), Kowanyama.

Domrow (1946*c*) has discussed the misidentification of the original host of this species.

PTILONYSSUS NOVAEGUINEAE (Hirst)

Rhinonyssus novae-guineae Hirst, 1921, *Proc. zool. Soc. Lond.*, 1921: 769. The original spelling (with hyphen) is corrected above under Art. 32. *Passeronyssus novae-guineae*, Fain, 1960, *Revue Zool. Bot. afr.*, 61: 313. *Ptilonyssus novae-guineae*, Fain and Hyland, 1962, *Ann. Mag. nat. Hist.*, (13) 5: 346.

Previous record.—Magnificent rifle-bird, *Ptiloris magnificus* (Vieillot) (Paradiseidae, Passeriformes).

PTILONYSSUS CERCHNEIS Fain

Ptilonyssus cerchneis Fain, 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 133; Strandtmann, 1962, *Proc. ent. Soc. Wash.*, 64: 100; Bregetova, 1964, "Some problems of evolution of the rhinonyssid mites" (Nauka: Leningrad), p. 5; Domrow, 1965, *Acarologia*, 7: 457.

Previous records.—Brown hawk, *Falco berigora* Vigors and Horsfield (Falconidae, Falconiformes), Esk. Also Kowanyama. Nankeen kestrel, *F. cenchroides* Vigors and Horsfield, Mt Jukes. Also Esk.

Most of my specimens were heavily engorged when collected, and the opisthosomal cuticle has accordingly ruptured and crumpled during mounting procedures. One unfed specimen, however, does show the two areas of non-striate cuticle on the opisthonotum described by Strandtmann (1962), as well as a second, smaller pair slightly behind, and outside the first pair. Neither pair bears a seta and associated pore, and it would therefore seem that Strandtmann is correct in questioning whether these structures belong to the pygidial complex. I have examined 2 ♀ ♀ from the United States.

Genus STERNOSTOMA Berlese and Trouessart

Sternostoma Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest*, 2: 126; Furman, 1957, *Hilgardia*, 26: 474. Type-species *Sternostoma cryptorhynchum* Berlese and Trouessart, 1889, *Loc. cit.*, 127. *Sternostomum* Trouessart, 1895, *Rev. Sci. nat. appl.*, 42: 392. Unjustified emendation under Art. 33. Furman (1957) has pointed out the error of Vitzthum (1935) and his school in considering *Sternostoma* and *Sternostomum* distinct genera, even though Trouessart had explicitly stated that the type-species of the former was also that of his unjustified emendation. Nor is either name to be confused with *Rhinonyssus* Trouessart, 1894, *v. supra*, type-species *Rhinonyssus coniventris* Trouessart, 1894. *Agapornyssus* Gretillat, Capron, and Brygoo. 1959, *Acarologia*, 1: 376. Type-species *Agapornyssus faini* Gretillat *et al.*, 1959, *Loc. cit.*, 376. *Sternostomoides* Bregetova, 1964, "Some problems of evolution of the rhinonyssid mites" (Nauka: Leningrad). *Sternostomoides* is not mentioned in the text of this article, but occurs in an accompanying photograph of a table on host-specificity. This does not constitute publication under Art. 8; and, in any case, as no type-species is given, *Sternostomoides* is unavailable here under Art. 13. Also 1965, *Ent. Obozr.*, 44: 709. Type-species *Sternostomum technaui* Vitzthum, 1935, *J. Orn., Lpz.*, 83: 569. New synonymy. *Rhinosterna* Fain, 1964, *Revue Zool. Bot. afr.*, 70: 125. Type-species *Rhinosterna aymarae* Fain, 1964, *Loc. cit.*, 126. New synonymy. *Sternoecius* Fain and Aitken, 1967, *Bull. Inst. r. Sci. nat. Belg.*, 43: 24. Type-species *Sternoecius piprae* Fain and Aitken, 1967, *Loc. cit.*, 24. New synonymy.

Sternostomoides was erected for a group of three parasites of turdids (all considered conspecific below), which lack the opisthonotal shield. However, the existence of *S. inflatum* Fain (1963*c*) and *S. dureni* Fain (1956, 1957*e*), also from turdids, in which the opisthonotal shield is eroded and complete, respectively, makes the synonymy clear.

The cheliceral modifications in the last two taxa should be considered only of specific value, since the two species involved are otherwise typical of *Sternostoma.*

Key to females of Australian species of STERNOSTOMA

1. Podonotal shield evenly rounded anteriorly. Opisthonotal shield at most accompanied by small mesonotal shieldlets, or absent 2
Podonotal shield deeply excavated anteriorly. Opisthonotal shield accompanied by two extensive lateral shields .... *fulicae* Fain and Bafort
2 (1). Opisthonotal shield present 3
Opisthonotal shield absent .... *technaui* (Vitzthum)
3 (2). Posterolateral margin of podonotal shield with four setae (two medial and one in each corner) 4
Posterolateral margin of podonotal shield with two setae (medial) 9
4 (3). Two mesonotal shieldlets present. Palpal tibiotarsus twice as long as wide .... *thienponti* Fain
Mesonotal shieldlets absent. Palpal tibiotarsus at most only slightly longer than wide 5
5 (4). Setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV variously formed, but not as follows 6
Setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV slender, with expanded tips .... *cooremani* Fain
6 (5). Opisthonotal shield subquadrate. Setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV digitate ....*cuculorum* Fain
Opisthonotal shield at least one and a half times as long as wide Setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV variously formed, but not as above 7
7 (6). Dorsal shield heavily and evenly punctate. Palpal tibial sensory rods minute 8
Dorsal shield with strong subhexagonal reticulation giving the effect of honeycomb. Palpal tibial sensory rods more than half as long as tibiotarsus ....*gliciphilae* Domrow
8 (7). Sternal shield weakly and evenly granulate. Some of setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV peculiarly crimped .... *dureni* Fain
Sternal shield with distinct transverse reticulation. Setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV minute, unmodified .... *tracheacolum* Lawrence
9 (3). Lateral margins of podonotal shield evenly convex 10
Lateral margins of podontal shield triconcave .... *paddae* Fain
10 (9). Podonotal shield with five pairs of setae. Mesonotal shields absent 11
Podonotal shield with four pairs of setae. Mesonotal shields present........ .... *boydi* Strandtmann
11 (10). With one pair of setae between genital and anal shields. Setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV unmodified .... *neosittae*, n. sp.
With two pairs of setae between genital and anal shields. Setae al_{1-2}, av_{1-2}, pv_{1-2}, and pl_{1-2} on tarsi II-IV expanded ....*cryptorhynchum* Berlese and Trouessart

STERNOSTOMA THIENPONTI Fain

Sternostoma thienponti Fain, 1956, *Revue Zool. Bot. afr.*, 53: 152; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 68; Domrow, 1965, *Acarologia*, 7: 449; 1966, PROC. LINN. SOC. N.S.W., 90: 194. *Sternostoma thieponti* (*sic*) Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 135.

Previous records (all Passeriformes).—Black-backed magpie, *Gymnorhina tibicen* (Latham) (Cracticidae), Condamine. Black butcher-bird (black and red phases), *Cracticus quoyi* (Lesson and Garnot), Innisfail. Spangled drongo, *Chibia bracteata* (Gould) (Dicruridae).

New host record.—Pied butcher-bird, *Cracticus nigrogularis* (Gould), Kowanyama, 8.iv.1965, R. D. and J. S. W. (7 ♀♀).

STERNOSTOMA COOREMANI Fain

Sternostoma cooremani Fain, 1956, *Revue Zool. Bot. afr.,* 53: 154; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 72; Domrow, 1965, *Acarologia,* 7: 448; 1966, PROC. LINN. SOC. N.S.W., 90: 192. *Sternostoma cooremani halcyoni* Fain and Nadchatram, 1962, *Bull. Annls Soc. r. ent. Belg.,* 98: 280.

Previous records (all Coraciiformes).—Laughing kookaburra, *Dacelo gigas* (Boddaert) (Alcedinidae), Condamine. Also Esk. Mangrove-kingfisher, *Halcyon chloris* (Boddaert) (Alcedinidae). Rainbow-bird, *Merops ornatus* Latham (Meropidae), Esk. Also Windorah.

STERNOSTOMA CUCULORUM Fain

Sternostoma cuculorum Fain, 1956, *Revue Zool. Bot. afr.,* 53: 155; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 74; Nadchatram, McClure, and Lim, 1964, *J. fed. Malay St. Mus.,* 9: 106; Domrow, 1965, *Acarologia,* 7: 449. *Sternostoma cuculorum* var. *urolestis* Fain, 1959, *J. ent. Soc. sth. Afr.,* 22: 32. See Art. 45. New synonymy. *Sternostoma laniorum* Fain, 1956, *Revue Zool. Bot. afr.,* 53: 156; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 76; Domrow, 1965, *Acarologia,* 7: 449; 1966, PROC. LINN. SOC. N.S.W., 90: 193. New synonymy. *Sternostoma laniorum* var. *batis* Fain, 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 77; Fain and Nadchatram, 1962, *Bull. Annls Soc. r. ent. Belg.,* 98: 281; Strandtmann, 1960, *J. Kans. ent. Soc.,* 33: 135. See Art. 45. New synonymy. *Sternostoma batis,* Fain, 1962, *Revue Zool. Bot. afr.,* 66: 146; Nadchatram, McClure, and Lim, 1964, *J. fed. Malay St. Mus.,* 9: 106. *Sternostoma zosteropus* Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 194. New synonymy.

Until more tangible characters can be found to divide the above taxa, I would prefer to consider them conspecific. The character of the claws originally noted for *S. zosteropus* does not, in fact, hold good. It may be that in this (and in one other case, *viz. Ptilonyssus motacillae, v. supra*); I have been too radical in my synonymy, but it is virtually impossible to key their component taxa as presently described.

Previous records.—Fan-tailed cuckoo, *Cacomantis pyrrhophanus* (Vieillot) (Cuculidae, Cuculiformes), Esk. Also Innisfail and Kowanyama. Willie wagtail, *Rhipidura leucophrys* (Latham) (Muscicapidae, Passeriformes), Esk. Also Kowanyama. Leaden flycatcher, *Myiagra rubecula* (Latham) Musci capidae), Innisfail. Pale-yellow robin, *Eopsaltria capito* Gould (Muscicapidae), Innisfail. Rufous strike-thrush, *Colluricincla megarhyncha* (Quoy and Gaimard) (Pachycephalidae, Passeriformes), Innisfail. Crested bellbird, *Oreoica gutturalis* (Vigors and Horsfield) (Falcunculidae, Passeriformes), Mitchell. Grey-backed silvereye, *Zosterops lateralis* (Latham) (Zosteropidae, Passeriformes), Mt. Jukes.

New host records.—Brush cuckoo, *C. variolosus* (Vigors and Horsfield), Kowanyama, 14.iv.1965, R. D. (22 ♀ ♀). Koel, *Eudynamys orientalis* (Linnaeus) (Cuculidae), Esk, 6.x.1966, R. D. and J. S. W. (14 ♀ ♀). Australian pied flycatcher, *Arses kaupi* Gould (Muscicapidae), Innisfail, 5.viii.1965, R. D. and J. S. W. (19 ♀ ♀). Spectacled flycatcher, *Monarcha trivirgata* (Temminck) (Muscicapidae), Innisfail, 31.viii.1965, H. I. McD. (10 ♀ ♀).

STERNOSTOMA DURENI Fain

Sternostoma dureni Fain, 1956, *Rev. Zool. Bot. afr.,* 53: 153; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 68.

This species, whose type-host is an African thrush, may now be recorded from Australia: 4 ♀ ♀ from an Australian ground-thrush, *Oreocincla lunulata* (Latham) (Turdidae, Passeriformes), Wilson's Peak, 15.v.1967, R. D. and B. H. K.

STERNOSTOMA TRACHEACOLUM Lawrence

Sternostoma tracheacolum Lawrence, 1948, *J. Parasit.*, 34: 366; Bregetova, 1951, *Parazit. Sb.*, 13: 116; Furman, 1957, *Hilgardia*, 26: 478; Fain, 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 65; Fain and Hyland, 1962, *Parasitology*, 52: 404; Strandtmann, 1960, *J. Kans. ent. Soc.*, 33: 137; Domrow, 1965, *Acarologia*, 7: 449; 1966, PROC. LINN. SOC. N.S.W., 90: 194; Murray, 1966, *Aust. vet. J.*, 42: 262. *Sternostoma meddai* Lombardini, 1953, *Redia*, 38: 187. *Sternostoma castroae* Fain, 1956, *Revue Zool. Bot. afr.*, 53: 393. *Agapornyssus faini* Gretillat, Capron, and Brygoo, 1959, *Acarologia*, 1: 376.

Previous records (all Passeriformes except the first).—Budgerygah (aviary-bred), *Melopsittacus undulatus* (Shaw) (Psittacidae, Psittaciformes). Common swallow, *Hirundo rustica* Linnaeus (Hirundinidae). Australian reed-warbler, *Acrocephalus australis* (Gould) (Sylviidae). Yellow-breasted sunbird, *Cyrtostomus frenatus* (Müller) (Nectariniidae). Goldfinch (introduced), *Carduelis carduelis* (Linnaeus) (Fringillidae). House-sparrow (introduced), *Passer domesticus* (Linneaus) (Fringillidae). Canary (introduced cage-bird), *Serinus canaria* (Linneaus) (Fringillidae). Gouldian finch (aviary-bred), *Poephila gouldiae* (Gould) (Ploceidae), Sydney.

This mite is the cause of severe respiratory complications in cage-birds (Fain and Carpentier, 1958; Fain and Hyland, 1962*a*; Murray, 1966; Mathey, 1967).

STERNOSTOMA GLICIPHILAE Domrow

Sternostoma gliciphilae Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 192.

Previous record.—Brown honeyeater, *Gliciphila indistincta* (Vigors and Horsfield) (Meliphagidae, Passeriformes), Esk.

STERNOSTOMA NEOSITTAE, n. sp.

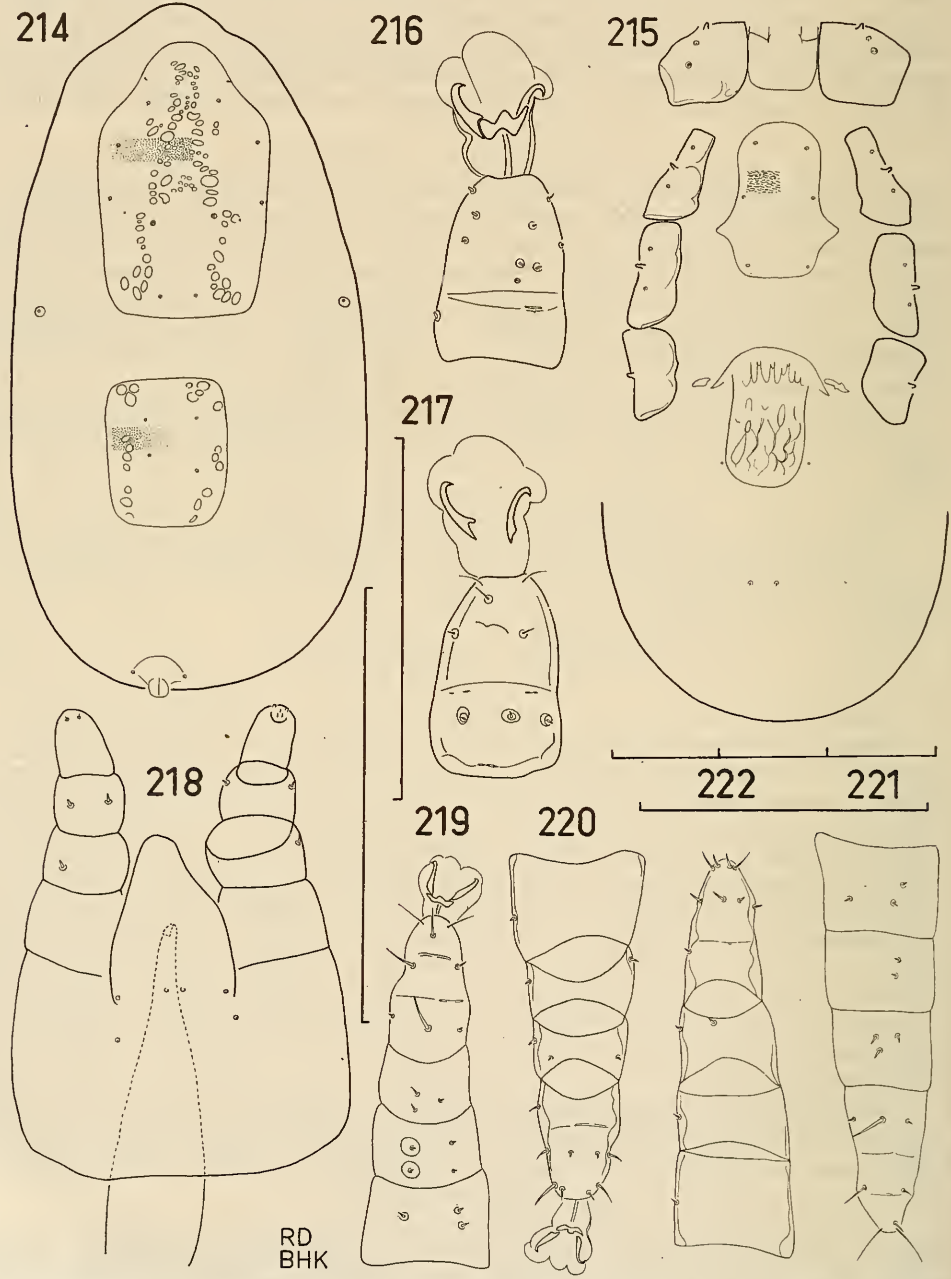
(Figs. 138, 214–218)

Sternostoma sp. Domrow, 1967, PROC. LINN. SOC. N.S.W., 91: 217.

Diagnosis.—The new species, which lacks setae in the posterolateral angles of the podonotal shield, and does not show the digitate, or even apically expanded setae $al_{1\text{-}2}$, $av_{1\text{-}2}$, $pv_{1\text{-}2}$, and $pl_{1\text{-}2}$ on tarsi II–IV characteristic of such species as the type, *S. cryptorhynchum* (well figured from the original material by Furman, 1957, and Fain, 1957*e*), may best be compared with *S. boydi* Strandtmann (1951) and *S. inflatum* Fain (1963*e*). The former (originally described from the sanderling, Scolopacidae, Charadriiformes) is separable by the presence of only four pairs of setae on the podonotal shield (*v. infra*), the presence of two pairs of setae, not one, behind the genital shield, and its relatively unmodified anal shield. The latter (from a thrush, Turdidae, Passeriformes) is separable by the eroded margins of its opisthonotal shield, and the presence, again, of two pairs of setae behind the genital shield.

Types.—Holotype female, sixteen paratype females, and two deutonymphs enclosing developing males from a striated sittella, *Neositta striata* (Gould) (Sittidae, Passeriformes), Kowanyama, 7.iv.1965, R. D. and J. S. W. Holotype N. I. C.; paratypes R. D., A. F., and R. W. S.

Female.—Idiosoma 495μ long in unengorged specimen, and from 640–690μ in engorged mounted specimens like that illustrated. Podonotal shield (Fig. 214) 260–270μ long, 160–165μ wide; anterior quarter narrower and strongly convex, sides subparallel, and posterior margin rectilinear. Surface with punctae heavier towards midline, particularly where two rows of muscle insertions converge. Setae in three anterolateral, and two posteromedian pairs; two pairs of pores present. Opisthonotal shield rectangular, 140–150μ long, 110–115μ wide, bearing four setae, and again showing punctae heaviest near muscle insertions. Stigmata without peritremes, unarmed. Dorsal cuticle without additional setae.



Figs 214–218. *Sternostoma neosittae*, n. sp. (♀ from *Neositta striata*).–214–215, Dorsal and ventral views of idiosoma. 216–217, Ventral and dorsal views of tarsus III. 218, Ventral view of capitulum (right palp in dorsal view).

Figs 219–222. *Ptilonyssus sittae* Fain (protonymph from *Climacteris picumnus*).–Dorsal and ventral views of femora-tarsi III–IV.

Sternal shield (Fig. 215) longer than wide, somewhat expanded between coxae II and III; surface lightly shagreened; SI–III present in longitudinal rows, but metasternal setae absent. Genital shield drop-shaped, with distinct recticulation and punctation; rayed operculum present; genital seta-pore complex reduced to remnant just off shield. Anal shield terminal, very weakly sclerotized, and without cribrum. Adanal setae present, but postanal absent. Ventral cuticle with one pair of setae behind genital shield. All body setae minute.

Leg setae again minute, barely longer than diameter of their alveoli. Coxal formula 2.2.2.0. Tarsus I with dorsodistal sensory islet as in Fig. 138. Tarsal formula—.18.18.18 (*mv* present). Tarsi and ambulacra II–IV stouter than I (Figs 216–217).

Capitulum undistinguished (Fig. 218). Capitular setae well forward, with one, or even both of pair frequently absent. HI not detected, II–III very weak. Dorsodistal rods on tibia very short. Tarsus obsolescent, with no trace of claw. Tritosternum absent.

STERNOSTOMA CRYPTORHYNCHUM Berlese and Trouessart

Sternostoma cryptorhynchum Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest,* 2:127; Furman, 1957, *Hilgardia,* 26:475; Fain, 1957, *Annls Mus. r. Congo belge Sér 8vo,* 60: 70.

Previous record.—House-sparrow (introduced), *Passer domesticus* (Linnaeus) (Fringillidae, Passeriformes).

STERNOSTOMA PADDAE Fain

Sternostoma paddae Fain, 1958, *Bull. Soc. r. Zool. Anvers,* 9: 8.

Previous record.—Java sparrow (introduced cage-bird), *Padda oryzivora* (Linnaeus) (Ploceidae, Passeriformes).

Fain and Bafort (1963) report this mite associated with severe conjunctivitis in this host.

STERNOSTOMA BOYDI Strandtmann

Sternostoma boydi (*sic*) Strandtmann, 1951, *J. Parasit.,* 37: 138 (a solecism now allowable under Rec. 31—the species was named for Dr. Elizabeth M. Boyd); Furman, 1957, *Hilgardia,* 26: 480; Fain, 1956, *Revue Zool. Bot. afr.,* 53: 151; 1960, *Ibid.,* 62: 95; Mitchell, 1961, *SWest Nat.,* 6: 103.

Previous records (all Charadriiformes).—White-winged black tern, *Chlidonias leucoptera* (Temminck) (Laridae). Sooty tern, *Sterna fuscata* Linnaeus (Laridae). This record is based on host-relationship (Amerson, 1967), and I have been unable to obtain specimens to confirm it. Turnstone, *Arenaria interpres* (Linnaeus) (Charadriidae). Common sandpiper, *Tringa hypoleuca* Linnaeus (Scolopacidae). Wood-sandpiper, *T. glareola* Linnaeus. Greenshank, *T. nebularia* (Gunnerus). Sanderling, *Crocethia alba* (Vroeg) (Scolopacidae). Knot, *Calidris canutus* (Linnaeus) (Scolopacidae).

I have examined eight ♀♀ of this species from Rwanda and the United States, all with the podonotal shield showing three pairs of anterolateral setae in addition to the single posteromedian pair originally figured.

STERNOSTOMA TECHNAUI (Vitzthum)

Sternostomum technaui Vitzthum, 1935, *J. Orn., Lpz.,* 83: 569. *Sternostoma technaui,* Furman, 1957, *Hilgardia,* 26: 482; Fain, 1963, *Bull. Annls Soc. r. ent. Belg.,* 99:174. *Sternostomoides technaui,* Bregetova, 1965, *Ent. Obozr.,* 44:709. *Sternostoma turdi* Zumpt and Till, 1955, *J. ent. Soc. sth.*

Afr., 18: 85; Furman, 1957, *Hilgardia*, 26: 481; Fain, 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 264; 1963, *Ibid.*, 99: 176. New synonymy. *Sternostomoides turdi*, Bregetova, 1965, *Ent. Obozr.*, 44: 712. *Sternostoma spatulatum* Furman, 1957, *Hilgardia*, 26: 480. New synonymy.

Previous records (all Turdidae, Passeriformes).—Blackbird (introduced), *Turdus merula* Linnaeus. Song-thrush (introduced), *T. philomelos* Brehm. Australian ground-thrush, *Oreocincla lunulata* (Latham).

New Australian record.—*O. lunulata*, Wilson's Peak, 15.v.1967, R. D. and B. H. K. (1 ♀).

I do not believe the three nominal species above reflect more than the intraspecific variation to be expected in any cosmopolitan parasite. All are parasites of turdids.

STERNOSTOMA FULICAE Fain and Bafort

Sternostoma fulicae Fain and Bafort, 1963, *Bull. Annls. Soc. r. ent. Belg.*, 99: 474.

Previous record.—Coot, *Fulica atra* Linnaeus (Rallidae, Gruiformes).

Family EREYNETIDAE

Subfamily SPELEOGNATHINAE

As the type-genus, *Speleognathus* Womersley (1936), was consistently so spelled by the original author, his rendering of the family-group name as "Spelaeognathidae" contravenes Art. 29. An obvious *lapsus calami*, it should be corrected under Art. 32.

Comments on the labile nature of most, if not all characters used in the three most recent classifications of the Speleognathinae (Fain, 1958*b*, 1962*d*, 1963*c*) continue to appear (Clark, 1964, 1967; Domrow, 1961, 1965*a*), and I therefore accept only the genera of the third of Fain's systems.

Key to adults of Australian genera of SPELEOGNATHINAE

1. All body and leg setae barbulate. Dorsal shield absent. Eyes normally absent, but present in *B. myzomelae*, n. sp. Sensillae weakly clavate. Palpi with three segments .... *Boydaia* Womersley
Body and leg setation with an admixture of filamentous setae. Dorsal shield and eyes absent, weak, or substantial. Sensillae normally filamentous, but globose in *Neoboydaia merops* (Fain). Palpi with one, two, or three segments 2
2 (1). Dorsal shield absent or minute. Palpi with one, two, or three segments 3
Dorsal shield substantial. Palpi with three segments .... *Speleognathopsis* Cooreman
3 (2). Eyes absent. Palpi with one or two segments .... *Neoboydaia* Fain
Eyes present. Palpi with two or three segments .. *Ophthalmognathus* Dubinin

Genus BOYDAIA Womersley

Boydaia Womersley, 1953, *Trans. R. Soc. S. Aust.*, 76: 82. Type-species *Speleognathus sturni* Boyd, 1948, *Proc. ent. Soc. Wash.*, 50: 9, *nec Boydaia angelae* Womersley (1953) as stated by Ford (1959) and Brooks and Strandtmann (1960). The latter is a species of *Lawrencarus* Fain (1957*c*) (Ereynetidae, Lawrencarinae), a genus inhabiting the nasal passages of frogs and toads.

Key to adults of Australian species of BOYDAIA

1. Coxal setae not 1.1.1.1. Hypostomal setae 2.2 2
Coxal setae 1.1.1.1. Hypostomal setae 1.1 .... *falconis* Fain
2 (1). External seta on coxa I normal 3
External seta on coxa I minute .... *hirundoae* Fain

3 (2). Trochanteral setae 1.1.0.0. Femoral setae 6.4.3.2 or more. Tibial setae 5.3.3.3 4
Trochanteral setae 1/0.0.0.0. Femoral setae 6.4.3.1. Tibial setae less than 5.3.3.3 7
4 (3). Femoral setae 6.4.3.2 5
Femoral setae 7.4.3.3 6
5 (4). Coxal setae slender, parallel-sided, about twice as long as diameter of their alveoli. Solenidion on tarsus II set in depression, but free. Posteroventral margin of basis capituli uniformly sclerotized .... *zosteropis* Fain
Coxal setae short, clavate, barely as long as diameter of their alveoli. Solenidion on tarsus II concealed in narrow invagination. Sclerotization of posteroventral margin of basis capituli interrupted medially .... *sturni* (Boyd)
6 (4). Eyes absent. Coxal setae 2.1.1.0 .... *spatulata* Fain
Eyes present. Coxal setae 2.1.2.0 .... *myzomelae*, n. sp.
7 (3). Tibial setae 5.3.2.3.......... *crassipes* (Berlese and Trouessart), n. comb.
Tibial setae 4.2.2.2 .... *maluri*, n. sp.

BOYDAIA STURNI (Boyd)

Speleognathus sturni Boyd, 1948, *Proc. ent. Soc. Wash.*, 50: 9; 1951, *J. Parasit.*, 37: 79 (where the author lists the locality of some Indian specimens in the form of a binomen allegedly identifying one of the mynas); *nec* Porter and Strandtmann, 1952, *Tex. J. Sci.*, 4: 394. *Boydaia sturni*, Fain, 1961, *Bull. Annls Soc. r. ent. Belg.*, 97: 57; 1963, *Bull. Inst. r. Sci. nat. Belg.*, 39: 56; *Z. ParasitKde*, 22: 371.

Previous records (both introduced Sturnidae, Passeriformes).—Starling, *Sturnus vulgaris* Linnaeus. Common myna, *Acridotheres tristis* (Linnaeus).

New Australian record.—*S. vulgaris*, Esk, 6.x.1966, R. D. and J. S. W. (13 adults, 4 larvae).

BOYDAIA ZOSTEROPIS Fain

Boydaia zosteropis Fain, 1963, *Bull. Inst. r. Sci. nat. Belg.*, 39: 43.

This species, previously known only from an African silvereye, may now be recorded from Australia: 2 adults and 2 larvae from a grey-backed silvereye, *Zosterops lateralis* (Latham) (Zosteropidae, Passeriformes), Mt. Nebo, 17.xi.1965, E. H. D.

BOYDAIA HIRUNDOAE Fain

Boydaia hirundoae Fain, 1956, *Annls Parasit. hum. comp.*, 31: 661; 1958, *Revue Zool. Bot. afr.*, 58: 180; 1963, *Bull. Annls Soc. r. ent. Belg.*, 99: 179; Domrow, 1965; *Acarologia*, 7: 43.

Previous records (both Hirundinidae, Passeriformes).—Welcome swallow, *Hirundo neoxena* Gould, Brisbane. Common swallow (vagrant), *H. rustica* Linnaeus.

New host record.—Fairy martin, *Hylochelidon ariel* (Gould) (Hirundinidae), Windorah, 20.i.1966, R. D., D. J. M., and J. S. W. (1 larva).

BOYDAIA FALCONIS Fain

Boydaia falconis Fain, 1956, *Annls Parasit. hum. comp.*, 31: 657.

This African species is now known also to occur in Australia: 35 adults and 1 larva from brown hawks, *Falco berigora* Vigors and Horsfield (Falconidae, Falconiformes), Kowanyama, 27.x and 9.xi.1965, R. D.

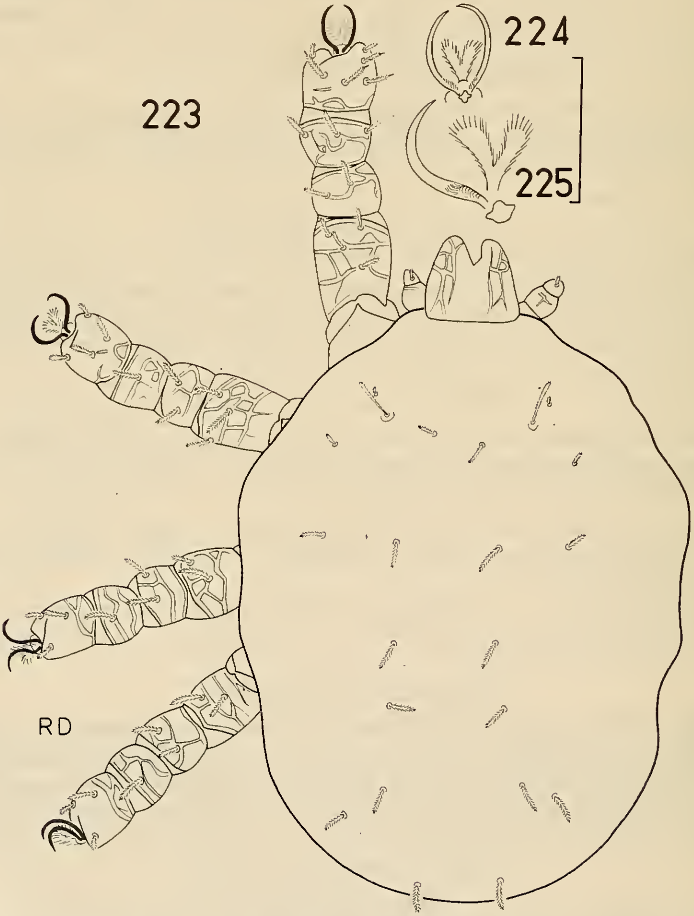
BOYDAIA SPATULATA Fain

(Figs. 223–226)

Boydaia sturni var. *spatulata* Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 695. See Art. 45. *Boydaia spatulata*, Fain, 1956, *Riv. Parassit.*, 17: 33; 1956, *Revue Zool. Bot. afr.*, 53: 43; 1956, *Annls Parasit. hum. comp.*, 31: 651.

Fain (1963*c*) has detailed a group of five African and European species centred around *B. spatulata,* which, while distinguishable as larvae, are scarcely separable as adults. In the absence of immatures, I now record Fain's species from three new Australian hosts (Meliphagidae, Passeriformes): 1 ♀ from a banded honeyeater, *Myzomela pectoralis* Gould, Kowanyama, 23.x.1965; 1 ♀ from a noisy friar-bird, *Philemon corniculatus* (Latham), Esk, 5.x.1965; and 1 ♀ from a little friar-bird, *P. citreogularis* (Gould), Charleville, 14.i.1966, R. D., D. J. M., and J. S. W.

The specimen illustrated is from *Myzomela* Vigors and Horsfield, and has the following measurements: idiosoma 410μ long, 314μ wide; capitulum 93μ long, 82μ wide; palpi 35μ long; leg I 315, II 266, III 249, IV 270μ long. Setal formulae for legs: coxae 2.1.1.0; trochanters 1.1.0.0; femora 7.4.3.3; genua 4.4.3.3; tibiae 5.3.3.3; tarsi 12.8.7.7. The specimens from *Philemon* Vieillot are considerably larger, but show identical chaetotaxy, although, in fact, the following minor variants occur: genital setae 5.4 (*Myzomela*); hypostomal setae 2.1 (*P. corniculatus*); femora I–II 7.4/6.3, genu II 4.3, and tibia IV 3.4 (*P. citerogularis*—some broken cuticle from the body is



Figs 223–225. *Boydaia spatulata* Fain.–223, Dorsal view of adult from *Myzomela pectoralis*. 224–225, claws and pulvilli of adults from *M. pectoralis* and *Philemon citreogularis* (at twice indicated scale).

folded over one leg IV, but the four setae in question appear to lie beneath it, and, therefore, to belong to the tibial, and not to the idiosomal series. Some measurements are: capitulum 116μ long, 103μ wide; palpi 54μ long; leg II 350–365, III 320–340, IV 345–375μ long (excluding ambulacra, but including coxae).

The sensillae in the series from *Myzomela* are 32μ long and about one-tenth as broad; in specimens from *Philemon,* they are 43–45μ long and noticeably more slender (one-fifteenth as broad as long).

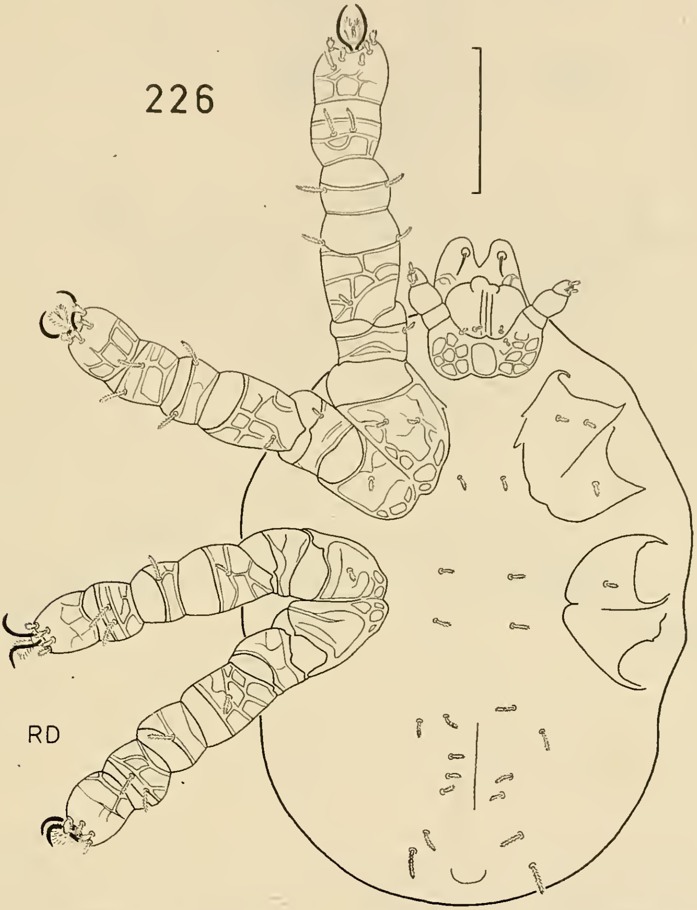


Fig. 226. *Boydaia spatulata* Fain.–Ventral view of adult from *Myzomela pectoralis.*

BOYDAIA MYZOMELAE, n. sp.

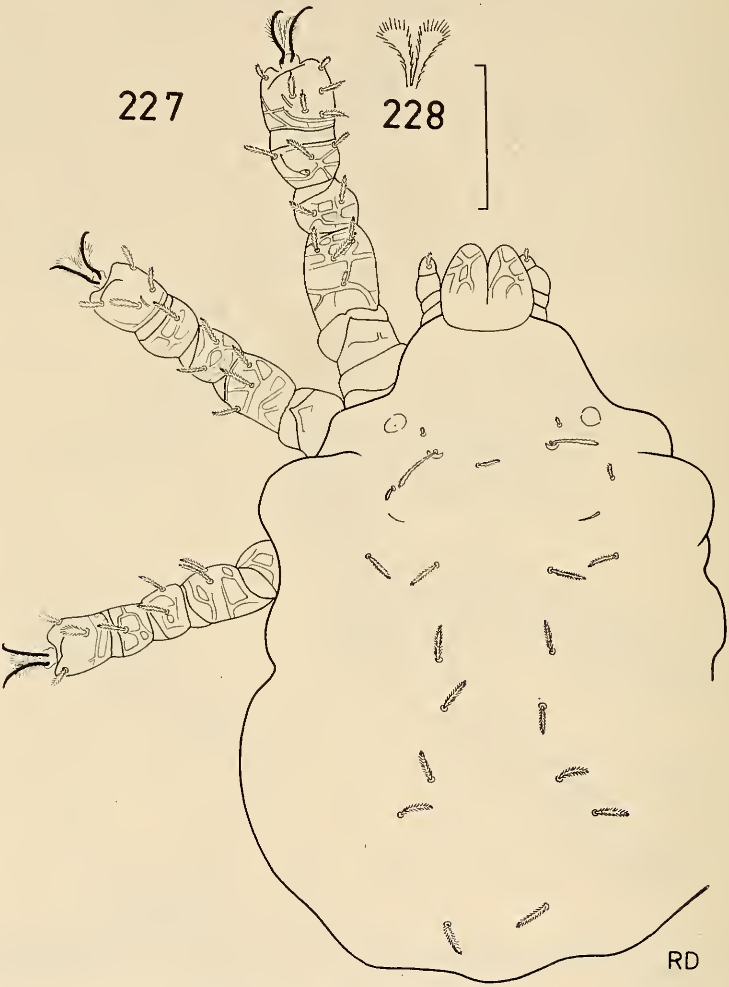
(Figs. 227–229)

Diagnosis.—*B. myzomelae* is related, on chaetotaxy, to the five species centred around *B. spatulata* (see Fain, 1963*c,* and discussion on that species above), but may easily be separated from them by the coxal formula (2.1.2.0, not 2.1.1.0) and the presence of distinct eyes.

Two other species of *Boydaia, B. hirundoae* and *B. psalidoprocnei* Fain, show a coxal formula 2.1.2.0, but are distinct from *B. myzomelae* both morphologically (external seta on coxa I minute) and ecologically (hosts swallows, Hirundinidae, Passeriformes) (see Fain, 1963*c*).

Types.—Holotype female from a scarlet honeyeater, *Myzomela sanguinolenta* (Latham) (Meliphagidae, Passeriformes), Esk, 6.x.1966, R. D. and J. S. W. Holotype N. I. C.

Female.—Idiosoma engorged, ruptured during mounting procedure, 465μ long, 315μ wide across humeral prominences. Cuticle finely striate-punctate. Eyes sharply outlined, with corneae (Fig. 227). Sensillae 32μ long, very slightly clavate. Presensillary setae small, 2 in number. Postsensillary setae 3.4.2.2.4.2.



Figs 227–228. *Boydaia myzomelae*, n. sp. (adult from *Myzomela sanguinolenta*).–227, Dorsal view. 228, Pulvillus (at twice indicated scale).

Sternal setae 2+2.2. Genital setae 2.3/3.2 Anal setae 2.2 (Fig. 229).

Legs with reticulate subcuticular markings, I 302, II 275, III 250μ long (IV lacking except for coxae and one trochanter). Setal formulae: coxae 2.1.2.0; trochanters 1.1.0.0; femora 7.4.3.–; genua 4.4.3.–; tibiae 5.3.3.–; tarsi

12.8.7.–. Tarsi I and II with solenidion; tibia I with invaginated sensory organ.* Claws equal, of uniform diameter except at tip, roughened internally near basal angulation; retractable into dorsodistal pits in tarsi. Pulvilli directed upwardly between claws, bifid, with each arm expanded distally and flared externally; with many filaments on plantar surface (Fig. 228).

229

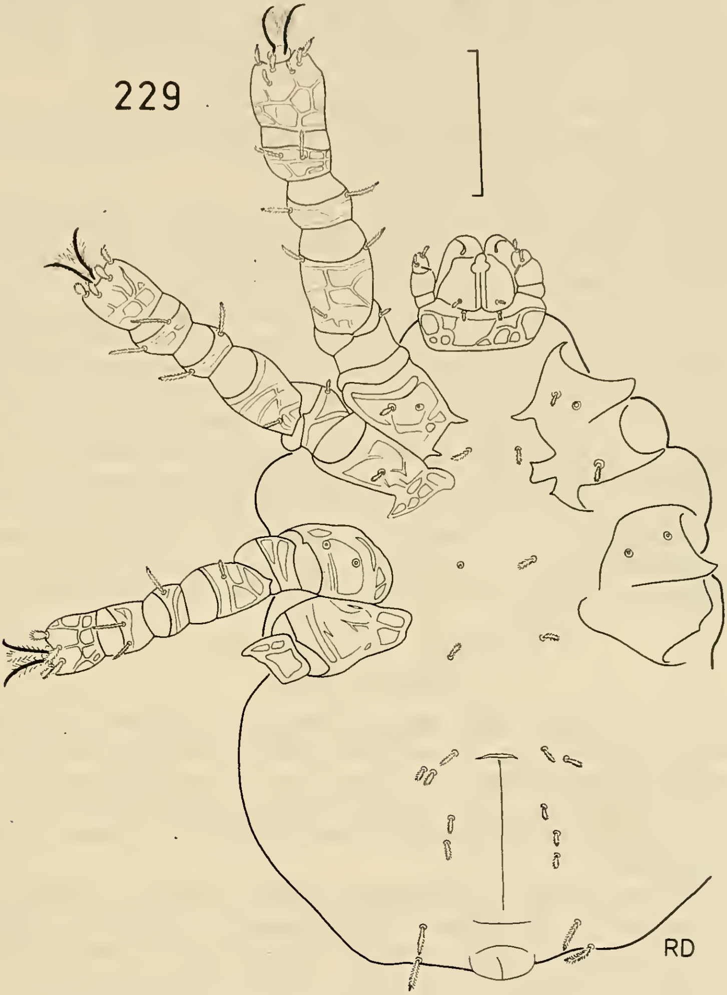


Fig. 229. *Boydaia myzomelae*, n, sp.–Ventral view of adult from *Myzomela sanguinolenta*.

Capitulum 80μ long, 90μ wide, reticulate; hypostomal setae 2.2. Palpi 3-segmented, 40μ long; setal formula 0.0.3; solenidion present on tarsus.

All setae barbulate (many on dorsum of idiosoma and legs appear, at lower magnification, to terminate in hyaline expansion, which, however, under oil-immersion, is seen to comprise merely shorter terminal setules); six setae on tarsus I and one on tarsus II with rod-like, hyaline extension apically.

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* These organs are treated more fully by Fain (1962*b*). They are reminiscent of the chemoreceptors of insects classified as *sensilla coeloconica* by Imms (1957).

BOYDAIA CRASSIPES (Berlese and Trouessart), n. comb.

Ereynetes crassipes Berlese and Trouessart, 1889, *Bull. Biblioth. scient. Ouest*, 2: 141. *Speleognathus sturni* Porter and Strandtmann, 1952, *Tex. J. Sci.*, 4: 394, *nec* Boyd, 1948, *Proc. ent. Soc. Wash.*, 50: 9. See Fain (1958*b*). *Boydaia nigra* Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 695; 1956, *Riv. Parassit.*, 17: 32; *Revue Zool. Bot. afr.*, 53: 44; *Annls Parasit. hum. comp.*, 31: 658; 1957, *Revue Zool. Bot. afr.*, 55: 254; 1958, *Ibid.*, 58: 179; 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 266; 1963, *Z. ParasitKde*, 22: 371; *Bull. Annls Soc. r. ent. Belg.*, 99: 179. New synonymy.

Previous records (all Passeriformes).—Yellow wagtail (vagrant), *Motacilla flava* Linnaeus (Motacillidae). Goldfinch (introduced), *Carduelis carduelis* (Linnaeus) (Fringillidae). House-sparrow (introduced), *Passer domesticus* (Linnaeus) (Fringillidae).

New host record.—White-winged triller, *Lalage tricolor* (Swainson) (Campophagidae, Passeriformes), Charleville, 14.i.1966, R. D., D. J. M., and J. S. W.; Kowanyama, iv.1965, R. D. (33 adults, 9 larvae).

I accept the synonymy suggested by Fain (1957*c*). As in the case of *Ptilonyssus nitzschi* above, I believe this procedure preferable to accepting both a *nomen dubium* and a later taxon which is almost certainly its junior synonym. It should be confirmed by the formal designation of a neotype when the group is next revised (Art. 75). Neither Lombardini (1936) nor Fain (1964*e*), in their listings of the ereynetids in the Berlese collection in Florence, mention this species, and Dr. M. H. Naudo tells me there is none in the Trouessart collection in Paris. As with all these mites, the true locality is the nasal passage of their specific host wherever it may exist, rather than any fixed geographical area, so I see no objection to choosing one of Porter and Strandtmann's specimens, providing they are in good condition.

BOYDAIA MALURI, n. sp.

(Figs 230–235)

Diagnosis.—*B maluri* falls among those small species of *Boydaia* with a considerably reduced leg setation (Fain, 1963*c*), and may best be compared with *B. trochila* Fain (1958*a*). However, the two species may be separated by the setation (3, not 2 or 1) of genu IV, and the presence or absence of a solenidion on the palpal tarsus. Lesser differences appear to lie in the claws and pulvilli.

The host relationships should also be noted. *B. maluri* is from peculiarly Australian "wrens" (Sylviidae, Passeriformes), while *B. trochila* was described from hummingbirds, which belong to the neotropical family Trochilidae (Apodiformes).

Types.—Holotype female from a lovely wren, *Malurus amabilis* Gould (Sylviidae, Passeriformes), Cowley Beach, 9.viii.1965, R. D. and J. S. W. Three females one of which is designated paratype) from a red-backed wren, *M. melanocephalus* (Latham), Kowanyama, 22.xi.1965, R. D. Holotype N. I. C.; paratype R. D.

Female.—Idiosoma (Fig. 231) engorged and pigmented in all specimens, with humeral prominences; from 374x308, through 432x345 (figured), to 528x385μ depending on degree of compression during mounting procedure. Cuticle minutely striate-punctate. Eyes absent. Sensillae 24–27μ long, very slightly clavate. Presensillary setae minute, 2 in number. Postsensillary setae 4.4.2.2.4.2.

Sternal setae 2+2.2. Genital setae 2.3/3.2 Anal setae 2.2 (Fig. 230).

Legs (Figs. 234–235) with reticulate subcuticlar markings, 213, 193, 186, and 205μ long in two specimens figured. Setal formulae: coxae 2.1.1.0; trochanters 1.0.–.– (*M. amabilis*), 0.0.0.0 (*M. melanocephalus*); femora 6.4.3.1; genua 4.4.3.3; tibiae 4.2.2.2; tarsi 12.8.7.7. Tarsi I and II with solenidion;

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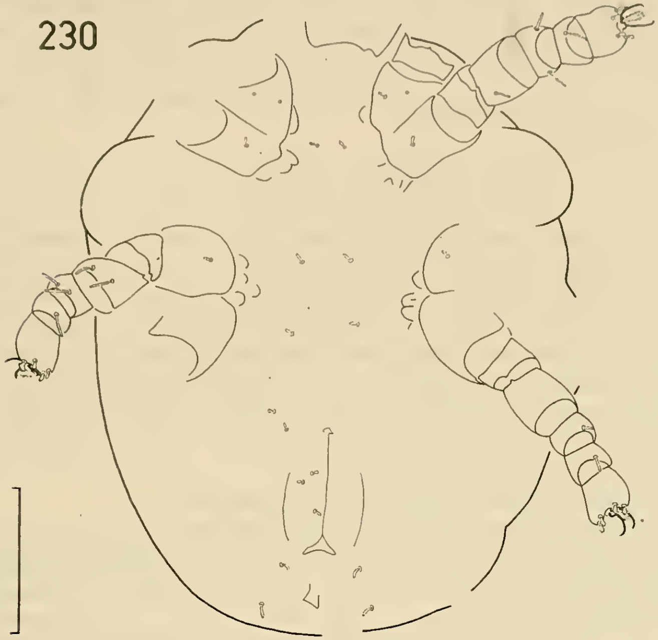

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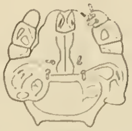

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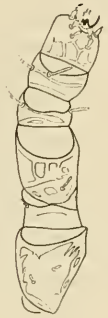

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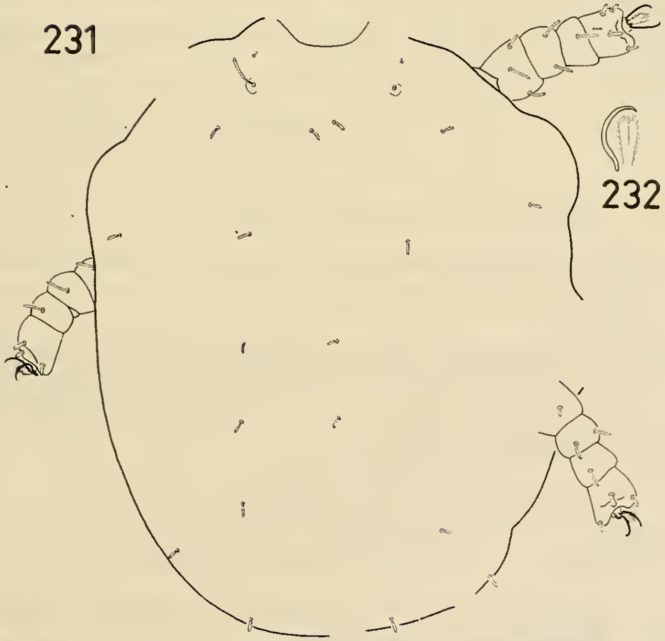

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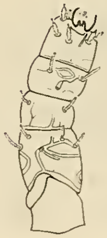

Figs 230–232. *Boydaia maluri*, n. sp. (adult from *Malurus melanocephalus*).–230–231, Ventral and dorsal views. 232, Pulvillus (at twice indicated scale).

Figs 233–235. *Boydaia maluri*, n. sp. (adult from *Malurus amabilis*).–233, Ventral view of capitulum. 234–235, Ventral and dorsal views of leg I.

tibia I with invaginated sensory organ. Claws equal, simple, of uniform diameter except at tip; retractable into dorsodistal excavations in tarsi. Pulvilli (Fig. 232) directed upwardly between claws, apparently entire except for weak distal cleft; with numerous filaments on plantar surface.

Capitulum (Fig. 233) 80μ long, 85μ wide, reticulate; hypostomal setae 2.2. Palpi 3-segmented, 36μ long; setal formula 0.0.3; solenidion present on tarsus.

All setae barbulate; six on tarsus I and one on tarsus II with expanded, hyaline extension distally.

Genus NEOBOYDAIA Fain

Neoboydaia Fain, 1958, *Revue Zool. Bot. afr.*, 58: 177. Type-species *Boydaia philomachi* Fain, 1956, *Riv. Parassit.*, 17: 27. *Ralliboydaia* Fain, 1962, *Revue Zool. Bot. afr.*, 66: 365. Type-species *Neoboydaia* (*Ralliboydaia*) *latiralli* Fain, 1962, *Loc. cit.*, 365. The original spelling is a *lapsus calami* based on the host-genus *Laterallus* Bonaparte, and was subsequently corrected to *lateralli* under Art. 32 by Fain (1964*b*). *Aureliania* Fain, 1958, *Revue Zool. Bot. afr.*, 58: 177. Type-species *Boydaia aureliani* Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 694.

Key to adults of Australian species of NEOBOYDAIA

1. Presensillary setae minute. Palpi with two segments 2
Presensillary setae normal. Palpi with one segment 3
2 (1). Genital setae 6.6. Anal setae 1.1. Coxal setae 2.1.1.0. Femoral setae 5.4.3.2. Palpal setae 0.3 .... *philomachi* Fain
Genital setae 4.4. Anal setae 2.2. Coxal setae 2.1.1.1. Femoral setae 4.3.2.2. Palpal setae 1.2 .... *psittaculae* Fain
3 (1). First pair of postsensillary setae present. Sensillae filamentous. Hypostomal setae 2.2 4
First pair of postsensillary setae absent. Sensillae globose. Hypostomal setae 0.0 .... *merops* (Fain)
4 (3). Sternal setae 2.2.0. Coxal setae 1.1.1.1. Trochanteral setae 0.0.0.0. .... *aureliani* (Fain)
Sternal setae 2.2.2. Coxal setae 2.1.1.1. Trochanteral setae 1.1.0.0 .... *colymbiformi* Clark

NEOBOYDAIA PHILOMACHI (Fain)

Boydaia philomachi Fain, 1958, *Riv. Parassit.*, 17: 27; 1964, *Annls Mus. r. Afr. cent. Sér. 8vo*, 132: 141; Clark, 1964, *J. Parasit.*, 50: 160; Domrow, 1965, *Acarologia*, 7: 43.

Previous records (all Scolopacidae, Charadriiformes).—Bar-tailed godwit, *Limosa lapponica* (Linnaeus), Half Tide. Wood-sandpiper, *Tringa glareola* Linnaeus. American pectoral sandpiper, *Erolia melanotos* (Vieillot). Ruff (vagrant), *Philomachus pugnax* (Linnaeus).

NEOBOYDAIA PSITTACULAE Fain

Neoboydaia psittaculae Fain, 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 318.

Previous record.—Peach-faced lovebird (introduced cage-bird), *Agapornis roseicollis* (Vieillot) (Psittacidae, Psittaciformes).

New host records (both Psittacidae).—Rainbow-lorikeet, *Trichoglossus moluccanus* (Gmelin), Kowanyama, 1.xi.1965, R. D. (1 adult). Varied lorikeet, *Psitteuteles versicolor* (Lear), Kowanyama, 3.xi.1965, R. D. (1 adult).

NEOBOYDAIA AURELIANI (Fain)

Boydaia aureliani Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 694; 1956, *Revue Zool. Bot. afr.*, 53: 36. *Boydaia* (*Aureliania*) *aureliani*, Fain, 1958, *Revue Zool. Bot. afr.*, 58: 177. *Neoboydaia* (*Aureliania*) *aureliani*, Fain, 1963, *Bull. Annls Soc. r. ent. Belg.*, 99: 181; *Bull. Inst. r. Sci. nat. Belg.*, 39: 52.

Previous record.—Barn-owl, *Tyto alba* (Scopoli) (Tytonidae, Strigiformes).

NEOBOYDAIA MEROPS (Fain)

Boydaia merops Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 694; 1956, *Riv. Parassit.*, 17: 30; Domrow, 1966, PROC. LINN. SOC. N.S.W., 90: 210.

Previous record.—Rainbow-bird, *Merops ornatus* Latham (Meropidae, Coraciiformes), Esk and Innisfail. Also Kowanyama.

NEOBOYDAIA COLYMBIFORMI Clark

Neoboydaia colymbiformi Clark, 1964, *J. Parasit.*, 50: 158.

This species may now be recorded from Australia: 1 adult from a little grebe, *Podiceps ruficollis* (Vroeg) (Podicipidae, Podicipiformes), Esk, 15.v. 1965, I. D. F. and J. S. W. The only previous record is from an American grebe (*Colymbus* Linneaus, a name proscribed in favour of *Podiceps* Latham, see Thomson, 1964).

Genus OPHTHALMOGNATHUS Dubinin

Ophthalmognathus Dubinin, 1957, *Trudy leningr. Obshch. Estest.*, 73: 66. Type-species *Ophthalmognathus dogieli* Dubinin, 1957, *Loc. cit.*, 68. (=*Speleognathus schoutedeni* Fain, *v. infra*). *Neospeleognathus* Fain, 1958, *Revue Zool. Bot. afr.*, 58: 178. Type-species *Speleognathus schoutedeni* Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 695. New synonymy. *Trispeleognathus* Fain, 1958, *Revue Zool. Bot. afr.*, 58: 178. Type-species *Speleognathus striatus* Crossley, 1952, *J. Parasit.*, 38: 385. New synonymy. *Metaboydaia* Fain, 1962, *Bull. Inst. r. Sci. nat. Belg.*, 38: 7. Type-species *Speleognathus poffei* Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 695; 1956, *Revue Zool. Bot. afr.*, 53: 23. New synonymy.

The decision to accept *Ophthalmognathus* (see Fain, 1958*b*) leaves one only to note that, in the question of considering *Neospeleognathus* and *Trispeleognathus* (both originally raised as subgenera of *Speleognathus* by Fain, 1958*b*) as subgenera of a genus in its own right, Fain (1963*c*), as first reviser, was free under Rec. 24 to choose the latter for the generic name, although the former has precedence of position. Presumably, he was influenced by his intermediate classification (1962*d*), in which *Trispeleognathus* was given full generic rank, while *Neospeleognathus* was considered a subgenus of *Neoboydaia* Fain.

Key to adults of Australian species of OPHTHALMOGNATHUS

1. Coxal setae 2.1.1.1. Femoral setae more than 5.4.3.2. Hypostomal setae 1.1. Palpi with three segments, setation 0.1.3 2
Coxal setae 2.1.1.0. Femoral setae 5.4.3.2. Hypostomal setae 2.2. Palpi with two segments, setation 0.0.2. .... *schoutedeni* Fain, n. comb.
2 (1). Genital setae 5.5. Femoral setae 5.4.3.3. .... *striatus* (Crossley), n. comb.
Genital setae 4.4 Femoral setae 6.4.3.4 .... *accipitris*, n. sp.

OPHTHALMOGNATHUS STRIATUS (Crossley), n. comb.

Speleognathus striatus Crossley, 1952, *J. Parasit.*, 38: 385; Fain, 1956, *Revue Zool. Bot. afr.*, 53: 18. *Speleognathus* (*Trispeleognathus*) *striatus*, Fain, 1958, *Revue Zool. Bot. afr.*, 58: 178. *Trispeleognathus* (*Trispeleognathus*) *striatus*, Fain, 1963, *Bull. Inst. r. Sci. nat. Belg.*, 39: 53. *Trispeleognatus striatus* (*sic*) do Amaral, 1963, *Archos Inst. biol., S Paulo,* 30: 91.

Previous record.—Domestic pigeon (introduced), *Columba livia* Gmelin (Columbidae, Columbiformes).

OPHTHALMOGNATHUS ACCIPITRIS, n. sp.
(Figs 236–237)

Diagnosis.—Three species of *Ophthalmognathus s. s.** (*i.e.* with 3-segmented palpi) are known. *O. striatus* and *O. womersleyi* (Fain), n. comb., are both listed from Africa and the Americas, from various pigeons (Columbi-

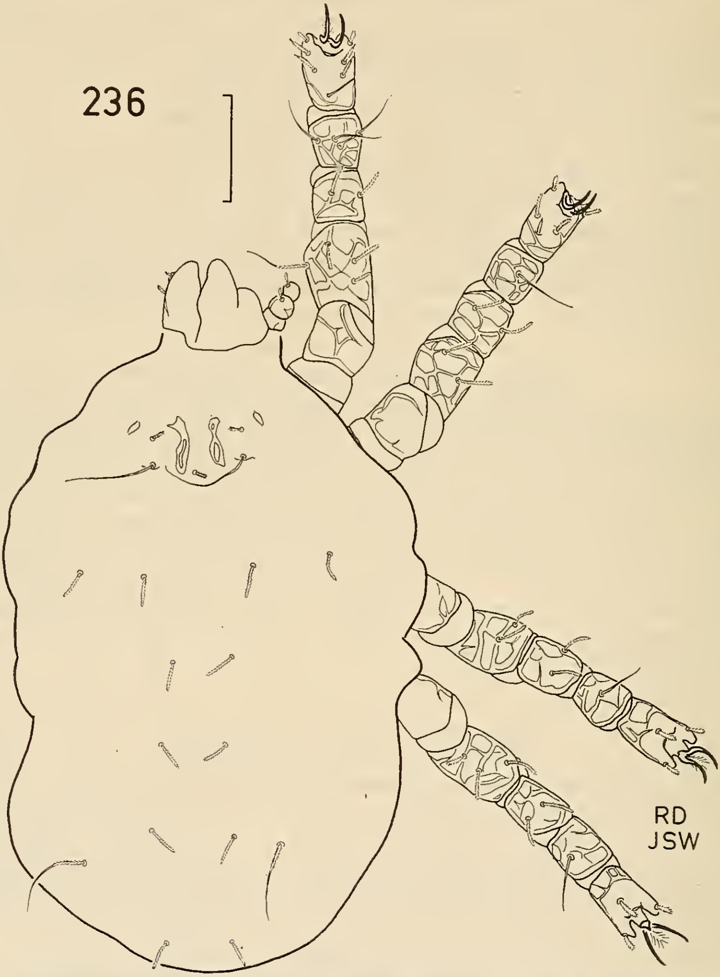

Fig. 236. *Ophthalmognathus accipitris*, n. sp.–Dorsal view of adult from *Accipiter fasciatus.*

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*It is a pity to have to note that acarological literature is becoming increasingly crowded with misspellings of numerous terms in common taxonomic use. This one and its partner are especially prone to suffer (*sensu stricta, sensu latu, sensu latus*), but other examples are common, *e.g. genus incertus, nomine nuda, species novum, sp. novo,* and *status novum.* There are also lapses in taxonomic names (*dividus, femuralis, flumenicola, inexspectatus,* and *omniphagous*); in morphological terms (endapodal, metatarsii, scutae, tarsae, and ventrum); and in general (a *corrigenda,* atennuated, detritis, hiati, and *in statuo quo*). This unconcern for a language which is both exact and the backbone of scientific terminology is inexcusable, and, regrettably, even the *Code* (Stoll *et al.*, 1964), in reducing Art. 31 to a mere Recommendation, has taken a step towards the stand that "scientific names . . . are meaningless since Latin is no longer an effective scientific language".

formes) and ducks (Anseriformes), respectively (Clark, 1958; Fain, 1963*c*; do Amaral, 1963*b*). Full morphological details are given by Fain (1963*c*), and *O. accipitris,* from an Australian goshawk (Falconiformes), may be separated from both by the setal formulae of the genitalia (4.4, not 5.5) and femora (6.4.3.4, not 5.4.3.3). *O. accipitris* further differs from *O. womersleyi* in showing two pairs (not one) of anal setae, and lacking the single seta on the palpal tibia.

The third known species, from a Brazilian pigeon, is *O. curicoi* (do Amaral, 1965), n. comb. It is not as well characterized, but differs from all three species discussed above in showing a coxal formula 2.0.1.0 rather than 2.1.1.1, and two pairs of gnathosomal setae rather than one.

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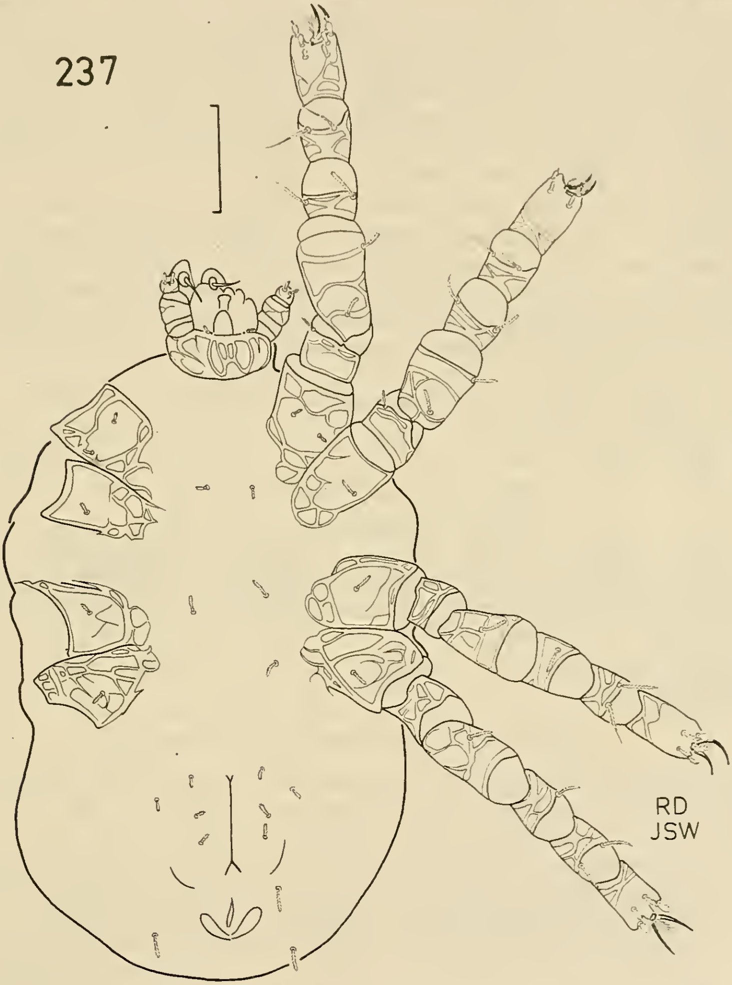

Fig. 237. *Ophthalmognathus accipitris*, n. sp.–Ventral view of adult from *Accipiter fasciatus.*

Types.—Holotype female and one paratype female from an Australian goshawk, *Accipiter fasciatus* (Vigors and Horsfield) (Accipitridae, Falconiformes), Kowanyama, 25.x.1966, R. D. Holotype N. I. C.; paratype R. D.

Female.—Idiosoma 594 and 616μ long in somewhat compressed condition. Cuticle finely striate on body, minutely, but densely aciculate on appendages.

Eyes present, but small, evident more by cessation of cuticular striae than by any definite corneae. Scutum divided into two longitudinal fragments (Fig. 236). Sensillae filamentous, simple. Dorsal setal formula (including presensillary pair) 2.2(1).4.2.2.4.2, all barbulate (except exterior pair of subposterior row, which are drawn out distally into filaments).

Sternal setae 2.2.1 in both specimens, but presumably 2.2.2 normally. Genital setae 1.3/3.1; anal setae 2.2(1). All barbulate (Fig. 237).

Setal formulae for legs as follows: coxae 2.1.1.1; trochanters 1.1.0.0; femora 6.4.3.4; genua 4.4.3.3; tibiae 5.3.3.3; tarsi 12.8.7.7. All barbulate except as follows: one seta on anterior margin of femur I distinctly, and occasional seta on some genua and tibiae slightly filamentous distally; tibiae with 3.1.1.1 dorsal setae entirely filamentous; some rounded, barbulate setae at tips of tarsi I–II with short, hyaline, apically expanded extensions. Tarsi I–II each with dorsal solenidion. Tibia I with invaginated sensory organ. Claws paired, subequal, retractable into dorso-distal excavations in tarsi. Pulvilli entire, bearing filaments.

Capitulum and legs with distinct reticulate pattern beneath cuticle. Palpi 3-segmented. Tibia with one seta dorsally; tarsus with one seta dorsally, and two setae and solenidion ventrally. Only two fully formed hypostomal setae present. All capitular setae barbulate, omitting vestiges of second hypostomal pair present between normal pair. Chelicerae drawn out distally into ventrally-directed stylets.

Ophthalmognathus schoutedeni (Fain), n. comb.

Speleognathus schoutedeni Fain, 1955, *Annls Soc. belge Méd. trop.*, 35: 695; 1956, *Revue Zool. Bot. afr.*, 53 : 18. *Ophthalmognathus dogieli* Dubinin, 1957, *Trudy leningr. Obshch. Estest.*, 73: 68. New synonymy.

A third species of this genus may also be recorded from Australia: 6 adults from nankeen night herons, *Nycticorax caledonicus* (Gmelin) (Ardeidae, Ciconiiformes), Esk and Kowanyama, 5.i.1966 and 6.iv.1965, R. D. and J. S. W. The only previous records are African, *N. nycticorax* (Linnaeus) and *Ardeola idae* (Hartlaub).

I accept the synonymy suggested by Fain (1958*b*). Both taxa were described from herons.

Genus Speleognathopsis Cooreman

Speleognathopsis Cooreman, 1954, *Annls Parasit. hum. comp.*, 29: 428. Type-species *Speleognathopsis galli* Cooreman, 1954, *Loc. cit.*, 429.

Key to adults of Australian species of Speleognathopsis

1. Presensillary setae present. Four or more setae in first postsensillary row. Anal setae 3.3. Coxal setal formula commencing 2.1.1 (seta on coxa II of *S. benoiti* Fain minute). Femoral setae more than 5.4.3.2 2
Presensillary setae absent. Two setae in first postsensillary row. Anal setae 1.1 Coxal setae 1.0.1.0 Femoral setae 5.4.3.2 ...... *galli* Cooreman
2. (1). Scutum transverse. Seta on coxa II of normal size. Pulvilli simple. Palpal setae 0.3 .... *porphyrionis* Domrow
Scutum elongate. Seta on coxa II minute. Pulvilli bifid. Palpal setae 1.3 .... *benoiti* Fain

Speleognathopsis galli Cooreman

Speleognathopsis galli Cooreman, 1954, *Annls Parasit. hum. comp.*, 29: 429; Fain, 1963, *Bull. Inst. r. Sci. nat. Belg.*, 39: 53.

Previous records (both Galliformes).—Domestic fowl (introduced), *Gallus gallus* (Linnaeus) (Phasianidae). Guinea fowl (introduced), *Numida meleagris* (Linnaeus) (Numididae).

Since writing this, I have seen 7 adults of this species, previously known only from Rwanda, from the nasal sinuses and nares of domestic fowls in villages in the Western Sepik District (near Irian Barat border), v.1966, N. Talbot.

SPELEOGNATHOPSIS PORPHYRIONIS Domrow

Speleognathopsis porphyrionis Domrow, 1965, *Acarologia,* 7: 44.

Previous record.—Eastern swamphen, *Porphyrio melanotus* Temminck (Rallidae, Gruiformes), Samford.

SPELEOGNATHOPSIS BENOITI Fain

Speleognathopsis benoiti Fain, 1955, *Annls Soc. belge Méd. trop.,* 35: 696; 1956, *Revue Zool. Bot. afr.,* 53: 29; Domrow, 1965, *Acarologia,* 7: 44; 1966, Proc. Linn. Soc. N.S.W., 90: 210; McDaniel, 1967, *Tex. J. Sci.,* 19: 94. *Speleognathopsis charadricola* Fain, 1964, *Revue Zool. Bot. afr.,* 70: 35. *Speleognathopsis wai* Fain, Vercammen-Grandjean, and Wagner, 1966, *Acta zool. path. antverp.,* 41: 115. New synonymy.

I have already noted (1966*b*) considerable intraspecific variation in this parasite of charadriiforms, and commend to the reader Marshall's statement on taxonomy (in Parker and Haswell, 1962).

Previous records (all Charadriidae, Charadriiformes).— Red-kneed dotterel, *Erythrogonys cinctus* Gould, Kowanyama. Masked plover, *Lobibyx miles* (Boddaert), Kowanyama. Grey plover, *Squatarola squatarola* (Linnaeus). Black-fronted dotterel, *Charadrius melanops* Vieillot, Esk. Also Kowanyama.

Family EPIDERMOPTIDAE

Subfamily TURBINOPTINAE

This latter group has usually been accorded full familial status in recent years, but this period has also seen the erection of annectant taxa such as the Heterocoptidae (Fain, 1967*a*). I therefore return the group to its original family, the Epidermoptidae, noting that, while the epidermoptines are skin-parasites of birds, the turbinoptines inhabit the outermost parts of the nasal cavity. Such a treatment is parallel to that accorded the other two groups of nasal parasites of birds discussed above.

Even though I have used the characters of the female genitalia and the male clasping apparatus in the primary dichotomies in the following key to genera, it should be noted that the groups so obtained are not correlated. For example, while females of *Rhinoptes* de Castro and Pereira and *Schoutedenocoptes* Fain both key out through the second half of couplet 2, males of the former diverge from those of the latter at couplet 7. Nor do the two genera show similar tarsal modifications, yet both parasitize phasianoids (Galliformes).

Key to Australian genera of TURBINOPTINAE

1.	Females	2
	Males	7
2 (1).	Endogynium absent. Vulva transverse	3
	Endogynium present. Vulva in form of inverted Y	4
3 (2).	All tarsi with two claws	*Turbinoptes* Boyd
	All tarsi with one claw	*Passerrhinoptes* Fain
4 (2).	All tarsi with two claws	*Oxleya* Domrow
	All tarsi not with two claws	5
5 (4).	All tarsi very short and heavily sclerotized, with at least one claw	6
	Only tarsi I-II very short and heavily sclerotized. Tarsi I-II with one claw. Tarsi III-IV without claws	*Schoutedenocoptes* Fain

6 (5). Tarsi I-II with two claws. Tarsi III-IV with one claw .... *Rhinoptes* de Castro and Pereira
All tarsi with one claw .... *Mycteroptes* Fain
7 (1). Body rounded posteriorly. Anal suckers minute 8
Body bilobed posteriorly. Anal suckers distinct 10
8 (7). Tarsi I-II with two claws. Tarsi III-IV with one claw .... *Rhinoptes* de Castro and Pereira
All tarsi with one claw 9
9 (8). Epimera I free .... *Mycteroptes* Fain
Epimera I fused .... *Passerrhinoptes* Fain
10 (7). All tarsi with two claws. Legs III-IV subequal 11
Tarsi I-II with one claw. Tarsi III-IV without claws. Leg IV considerably smaller than III .... *Schoutedenocoptes* Fain
11 (10). Dorsum unarmed except for minute propodosomal shield .... *Oxleya* Domrow
Dorsum with extensive hysterosomal shield in addition to propodosomal shield .... *Turbinoptes* Boyd

Genus Turbinoptes Boyd

Turbinoptes Boyd, 1949, *J. Parasit.*, 35: 295. Type-species *Turbinoptes strandtmanni Boyd,* 1949, *Loc. cit.*, 295.

Turbinoptes strandtmanni Boyd

Turbinoptes strandtmanni Boyd, 1949, *J. Parasit.*, 35: 295; Fain, 1956, *Revue Zool. Bot. afr.*, 54: 222; 1960, *Ibid.*, 62: 101; 1962, *Bull. Annls Soc. r. ent. Belg.*, 98: 266; 1963, *Ibid.*, 99: 179; Dubinin and Snegireva, 1957, *Zool. Zh.*, 36: 204; Domrow, 1965, *Acarologia,* 7: 90.

Previous records (all Charadriiformes).—Silver gull, *Larus novaehollandiae* Stephens (Laridae), Half Tide. Whimbrel, *Numenius phaeopus* (Linnaeus), Scolopacidae. Common sandpiper, *Tringa hypoleuca* Linnaeus (Scolopacidae).

New host record.—Eastern curlew, *Numenius madagascarensis* (Linnaeus), Tin Can Bay, 22.viii.1966, R. D. and J. S. W. (32♀♀, 17♂♂, 6 nymphs).

New Australian record.—*N. phaeopus,* Tin Can Bay, 26.x.1966, R. D. and J. S. W. (7♀♀, 5♂♂).

Genus Passerrhinoptes Fain

Passerrhinoptes Fain, 1956, *Revue Zool. Bot. afr.*, 54: 216. Type-species *Passerrhinoptes andropadi* Fain, 1956, *Loc. cit.*, 217; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 30.

Passerrhinoptes pomatostomi Domrow

Passerrhinoptes pomatostomi Domrow, 1966, Proc. Linn. Soc. N.S.W., 90: 213.

Previous record.—Grey-crowned babbler, *Pomatostomus temporalis* (Vigors and Horsfield) (Timaliidae, Passeriformes), Esk. Also Condamine.

Genus Oxleya Domrow

Oxleya Domrow, 1965, *Acarologia,* 7: 85. Type-species *Oxleya podargi* Domrow, 1965, *Loc. cit.*, 85.

Oxleya podargi Domrow

Oxleya podargi Domrow, 1965, *Acarologia,* 7: 85.

Previous record.—Tawny frogmouth, *Podargus strigoides* (Latham) (Podargidae, Caprimulgiformes), Samford and Cobble Ck. Also Esk.

Genus SCHOUTEDENOCOPTES Fain

Schoutedenocoptes Fain, 1956, *Revue Zool. Bot. afr.*, 54: 210. Type-species *Schoutedenocoptes numidae* Fain, 1956, *Loc. cit.*, 211.

SCHOUTEDENOCOPTES NUMIDAE Fain

Schoutedenocoptes numidae Fain, 1956, *Revue Zool. Bot. afr.*, 54: 211; 1957, *Annls Mus. r. Congo belge Sér. 8vo*, 60: 17.

Previous record.—Guinea fowl (introduced), *Numida meleagris* (Linnaeus) (Numididae, Galliformes).

Genus RHINOPTES de Castro and Pereira

Rhinoptes de Castro and Pereira, 1951, *Archos Inst. biol., S Paulo,* 20: 67. Type-species *Rhinoptes gallinae* de Castro and Pereira, 1951, *Loc. cit.*, 67.

RHINOPTES GALLINAE de Castro and Pereira

Rhinoptes gallinae de Castro and Pereira, 1951, *Archos Inst. biol., S Paulo,* 20: 67; Domrow, 1965, *Acarologia,* 7: 90. *Rhinoptes pternistis* Fain, 1956, *Revue Zool. Bot. afr.*, 54: 221; 1957, *Annls Mus. r. Congo belge Sér. 8vo,* 60: 37. New synonymy.

Previous records (both Phasianidae, Galliformes).— Domestic fowl (introduced), *Gallus gallus* (Linnaeus). Brown quail, *Synoicus australis* (Latham), Dayboro and Chelona.

I would confirm here the synonymy implicit in an earlier note (Domrow, 1965*b*).

Genus MYCTEROPTES Fain

Mycteroptes Fain, 1956, *Revue Zool. Bot. afr.*, 54: 219. Type-species *Mycteroptes basilewskyi* Fain, 1956, *Loc. cit.*, 220.

MYCTEROPTES BASILEWSKYI Fain

Mycteroptes basilewskyi Fain, 1956, *Revue Zool. Bot. afr.*, 54: 220; 1957. *Annls Mus. r. Congo belge Sér. 8vo,* 60: 33.

This genus and species, previously known only from an African roller of the genus *Coracias* Linnaeus may now be recorded from Australia: 17 ♀ ♀, 1 ♂, and 6 nymphs from an eastern broad-billed roller, *Eurystomus orientalis* (Linnaeus) (Coraciidae, Coraciiformes), Esk, 5.x.1965, R. D. and J. S. W.

V. HOST-SPECIFICITY AND ZOOGEOGRAPHY

At the beginning of this study, I was surprised to find so many species, originally described from overseas birds, also present in Australia, but it soon became clear that this was due simply to the fact that these mites had never been searched for in Australia. Thus only 39 (39%) of the 99 rhinonyssines, four (21%) of the 19 speleognathines, and two (33%) of the six turbinoptines now known (or expected to occur) in Australia have proved to be new species. This represents an overall figure of 36% (45 out of 124 species). In the following discussion on the host-specificity and zoogeography of the Australian fauna, the species are discussed, as far as possible, in systematic order. Those I have described as new since the beginning of this study are indicated by an asterisk, as it is interesting to consider to what extent the hosts of these species are restricted to the Australian zoogeographical region.

(a) *Tinaminyssus*

The three species from psittacids are the only Australian members of this genus to retain the tritosternum. This structure is, however, in the process of regression, and is absent in other species from extra-Australian psittacids, *e.g. T. baforti* (Fain), n. comb., and *T. phalliger* (Fain), n. comb. (see Fain, 1963*e*, 1965*b*; Domrow, 1964*a*; *Wilson*, 1964, 1966*b*). The opisthonotal shield is also regressing in this group. The host-specificity of these three species is discussed in detail above in Section IV under *T. aprosmicti*. In essence, each has several hosts within well defined psittacid groups: *T. kakatuae** parasitizes crested species (cockatoos and the cockatiel), *T. aprosmicti** various parrots, and *T. trichoglossi** various lorikeets. However, although the Psittacidae (as well as the Columbidae and Alcedinidae, *v. infra*) have undergone considerable radiation in the Australian region, all three families are virtually cosmopolitan, and some of their newly described parasites have already been recorded in New Guinea, Indonesia, and the Philippines (Wilson, 1964, 1966*a*, *b*, 1968*a*, *b*). There is no reason therefore, not to expect them even further afield.

T. belopolskii has been recorded from all the continents except South America, and is restricted to the Ardeidae.

T. epileus is, as yet, known only from New Guinea, but it parasitizes a falconid which extends well into Australia.

The largest series (11 species) of Australian species of *Tinaminyssus* is that restricted to columbids. The simpler species, *i.e.* those lacking basally inflated setae on the legs and venter, may be divided into two groups depending on the postanal seta, yielding the sequences—(*i*) postanal seta present: *T. melloi*, *T. ocyphabus** and *T. hirtus*; and (*ii*) postanal seta absent: *T. columbae*, *T. megaloprepiae*,* *T. geopeliae*, *T. ptilinopi*, and *T. myristicivorae*.* The widespread *T. melloi* occurs in all three introduced ground-pigeons (Columbinae), which are primarily seed-eaters. Its remaining two hosts (*Columba norfolciensis* and *Leucosarcia melanoleuca*) are jungle-dwelling, seed- and fruit-eating members of the same subfamily. *T. ocyphabus* is known only from the peculiarly Australian *Ocyphaps* Gray, while *T. hirtus* is known from *Chalcophaps* Gould in the Philippines, New Guinea, and Australia. These are again columbines, the former typical of open forest, the latter of rain-forest. *T. columbae* is also widespread in the domestic pigeon, and has been once recorded from *Ocyphaps*, while *T. geopeliae* is restricted to *Geopelia* Swainson in Malaysia, the Philippines, New Guinea, Australia, and Hawaii (introduced). The remaining three species of the sequence are parasites of jungle-dwelling fruit-pigeons (Treroninae). *T. ptilinopi* has been recorded from *Sphenurus* Swainson in Taiwan, and is widespread from S. E. Asia to New Guinea in *Ptilinopus* Swainson, one of the known hosts extending well into Australia. *T. megaloprepiae* and *T. myristicivorae* are known only from their original Australian hosts.

The second group comprises *T. phabus*,* recorded only from *Phaps* Selby, an Australian columbine of the open forest, *T. macropygiae*, restricted to a jungle-dwelling columbine (*Macropygia* Swainson) in the Philippines, New Guinea, and Australia, and *T. welchi*,* a parasite of a treronine. Clearly, there is a tendency for the more advanced species of this genus to be found parasitizing the jungle-dwelling treronines rather than the more typical columbines.

There remain two species from alcedinids: *T. halcyonus** is common in *Halcyon* Swainson in the Philippines, New Guinea, and Australia, while *T. daceloae** has only been recorded from *Dacelo*, an Australian genus.

(*b*) *Larinyssus*

Of the two known species, *L. orbicularis* is cosmopolitan in the Laridae, and *L. benoiti* has been recorded from African and Australian glareolids.

(*c*) *Rallinyssus*

This compact genus is cosmopolitan and restricted to rallids. Of the two species without circumanal frills, *R. amaurornis* is known from two hosts in Taiwan and the Philippines, and *R. congolensis* from a further two in Rwanda and the Philippines. The range of one host of each species extends into Australia. Of the two species with circumanal frills, *R. gallinulae* has been recorded from Belgium, New Guinea, and Australia, and *R. caudistigmus* from the U.S.A., South Africa, New Guinea, and Australia. Host-specificity is again low, the former species having been recorded from five genera, and the latter from three of the same five (Wilson, 1965, 1967).

(*d*) *Rhinonyssus*

This genus is confined to water birds of several types, and the primary dichotomy in the key in Section IV above is based on the work of Strandtmann (1959). Of the species with a definite anal shield and compacted palpi, *R. rhinolethrum* is cosmopolitan in a very wide range of anseriform genera, while *R. poliocephali* is known from a single species of *Podiceps* Latham in both Africa and Australia. Of the species with the anal shield obsolescent and normal palpi, both *R. coniventris* and *R. minutus* are cosmopolitan parasites of a wide range of charadriiforms, while *R. sphenisci* has only been recorded from Sphenisciformes.

(*e*) *Ruandanyssus*

Of the two known species, *R. terpsiphonei* has a wide range of African and Australian passeriform hosts, while *R. artami** is as yet known only from Australian artamids. However, the latter may be expected to coexist with its host-family, which extends to S. E. Asia.

(*f*) *Rhinoecius*

This genus comprises several species, all restricted to the Strigiformes. Of the Australian species, *R. cooremani,* originally recorded from *Strix* Linnaeus in the U.S.A., here parasitizes *Ninox* Hodgson (also a strigid), while *R. tytonis* probably coexists with the widespread barn-owl, *Tyto alba* (Tytonidae).

(*g*) *Ptilonyssus*

Apart from three species noted below (*P. triscutatus, P. nitzschi,* and *P. cerchneis*), the 53 Australian members of this genus are restricted to the Passeriformes, and may conveniently be split into two major divisions depending on whether or not the opisthonotal shield is reduced merely to a pygidial complex. (The presence of metasternal setae is often, but not always correlated with this division.) The first division may again be once divided. Firstly, a group may be commenced with *P. maluri** and *P. colluricinclae** (parasites of peculiarly Australian sylviids and pachycephalids, two taxa often considered only as muscicapid subfamilies, see Thomson, 1964), which lead by way of *P. capitatus* (a widespread parasite of alaudids) to *P. carduelis, P. emberizae, P. pygmaeus, P. hirsti,* and *P. neochmiae** (all parasites of fringillids and ploceids, two widespread families of small granivores). (*P. neochmiae* lacks peritremes, but this minor morphological point should not be allowed to override an otherwise convincing unity.) The group closes with *P. struthideae** and *P. corcoracis,** two species lacking a cribrum and parasitizing two monotypic, and peculiarly Australian corvid genera. They appear closely related to *P. nucifragae,* a parasite of *Nucifraga* Brisson, a palaearctic member of the same family.

The second group, involving increasing fragmentation and reduction of the opisthonotal shield, includes seven species. In *P. triscutatus, P. dioptrornis, P. dicruri,* and *P. sittae,* the pygidial shield is discrete. The first is a parasite of meropids (Coraciiformes), while the other three parasitize muscicapids (including turdids), dicrurids, and sittids (including certhiids), respectively. All are widespread in Africa, Eurasia, and Australia. *P. ailuroedi,** an aberrant species with considerable mesonotal modifications, probably also belongs here. Its hosts belong to the Ptilonorhynchidae, a peculiarly Australian family near the end of the passerine series. On the other hand, *P. elbeli* and *P. angrensis* both lack a pygidial shield, the former being a parasite of Eurasian sturnids, while the latter parasitizes the cosmopolitan family Hirundinidae.

The second major division is best commenced with *P. nitzschi,* from a widespread caprimulgid (Caprimulgiformes). It is the only species to retain a fully developed tritosternum. However, from this point onward, it becomes increasingly difficult to correlate morphology and host-specificity. Thus the three major dichotomies used in the key in Section IV above (those depending on the degree of posterior truncation of the podonotal shield, the presence or absence of the postanal seta, and the condition of the pygidial shield) all lead to incongruities with the system based on host order that will now largely be followed.

Both *P. echinatus,* an isolated and widespread species from hirundinids, and some species from meliphagids (*v. infra*) show accessory podonotal shields, but the two groups do not seem otherwise related. Likewise, *P. pittae** (from an Australian pittid) is not necessarily close to the widespread sylviid parasite *P. acrocephali* (*v. infra*) merely because both have a pair of enlarged setae set close together on the posterior margin of the podonotal shield. It is possibly closer to *P. cractici,** *P. motacillae,* and *P. langei,* a trio comprising members of the so-called *sairae* species-group of Fain (1959, 1962*c*). Of these, the first is a parasite of three genera of Cracticidae (a peculiarly Australian family), the second is widespread and recorded from a variety of hosts, while the third is known only from the original record from a hirundinid in the U.S.S.R.

There now follows a group of eleven species from the Muscicapidae (or families sometimes included therein, see Keast, 1961). As mentioned above, it is difficult to arrange them naturally, but the degree of truncation of the podonotal shield has been given precedence over the absence of the postanal seta, and the division of the pygidial shield has been considered least likely to indicate true relationships. These criteria yield the sequences (only non-muscicapine hosts are indicated)—(*i*) species with podonotal shield not truncate, pygidial shield entire, and postanal seta present: *P. orthonychus** (from a timaliid), *P. microecae,** *P. terpsiphonei, P. bradypteri* (from a sylviid), and *P. acrocephali* (again from a sylviid) (*P. bradypteri* is the only species of the entire sequence to lack peritremes, but this alone does not, I believe, necessarily make it more closely related to any of the species listed above which also lack this character, *i.e.* the other species formerly included in *Passeronyssus* and *Cas,* see synonymy of *Ptilonyssus* in Section IV above. Clearly, many characters are polyphyletic in this weakly sclerotized group of endoparasites. *P. bradypteri* is therefore placed before *P. acrocephali,* the first species of the sequence to show an anterodorsal process on coxa II. This latter character then persists throughout the sequence, except for the last species, *P. psophodae*); (*ii*) similar to (*i*), but postanal seta absent: *P. monarchae;** (*iii*) similar to (*i*), but podonotal shield truncate: *P. setosae** and *P. gerygonae** (from a sylviid); (*iv*) similar to (*iii*), but pygidial shield divided: *P. rhipidurae;** and (*v*) similar to (*iii*), but postanal seta absent: *P. macclurei* and *P. psophodae** (from a falcunculid).

Of these eleven species, four have been recorded outside Australia. *P. terpsiphonei* has a very wide host range in Africa and S. E. Asia. *P. bradypteri* and *P. acrocephali* were originally recorded from Africa and Europe, respectively (the Australian host of the latter is also a species of *Acrocephalus* Naumann). *P. macclurei* was described from a Malayan species of *Rhipidura* Vigors and Horsfield, and is restricted, in Australia, to *R. leucophrys.* Of the other three Australian species of *Rhipidura, R. fuliginosa* carries only *P. rhipidurae,* while the two rain-forest species, *R. setosa* and *R. rufifrons,* each bear a variant of a third species, *P. setosae. P. monarchae* is known only from the original record, but *P. microecae* is known from two species of *Microeca* Gould, and *P. orthonychus* and *P. gerygonae* have both been taken a second time in their original host species. *P. psophodae* is certainly restricted to *Psophodes olivaceus.*

The family Muscicapidae is cosmopolitan, and, although it has radiated considerably in Australia, the parasites of muscicapines, at least, may be expected outside Australia, just as the widespread *P. terpsiphonei* is established in a wide range of Australian genera. The parasites of such peculiarly Australian branches of this radiation as the pachycephalines and malurines, however, may be restricted to this region. Finally, this group of eleven species from muscicapids provides the best Australian example of host-specificity at three levels: its members may be restricted to a single host family, genus, or species.

*P. grallinae** is an isolated species restricted to *Grallina cyanoleuca,* the sole Australian member of the small and aberrant Australopapuan family Grallinidae (see also diagnosis for *P. struthideae* in Section IV above).

There are four families of Old World and Australian nectar-feeders, the Zosteropidae (silvereyes), the Dicaeidae (flower peckers), the Nectariniidae (sunbirds), and the Meliphagidae (honeyeaters). *P. ruandae* and *P. dicaei,** two species with short, characteristically broad podonotal shields, are restricted to the first two, and *P. cinnyris* to the third of these families. *P. dicaei* is still only known from the original record from *Dicaeum* Cuvier in Australia, but the other two species are common in other members of their respective families both in S. E. Asia and Africa.

Some evidence is given above for a burst of speciation within *Ptilonyssus* in peculiarly Australian flycatchers. A similar burst is perhaps still in progress among the parasites of honeyeaters (which, unlike the cosmopolitan flycatchers, are virtually restricted to Australia), and variants of both *P. philemoni* and *P. gliciphilae* have been described in Section IV above. Such morphological gaps, correlated with host-specificity, are suggestive of isolation at a subspecific level, but it is difficult to confirm sexual isolation in a group with such specialized habits. In any case, mere experimental confirmation of sexual isolation is of doubtful value, and since it is as much an error to describe a true species as a subspecies as the reverse, the use of trinomina for these variants has been foregone (Mayr *et al.,* 1953).

Only one of the three major dichotomies discussed above under the species from flycatchers is available to divide the species from honeyeaters, *viz.*

the degree of truncation of the podonotal shield (the pygidial shield is variable in many species, and the postanal seta is always present). The application of this criterion yields the following two sequences—(*i*) podonotal shield not truncate: *P. myzanthae,* P. philemoni,* P. balimoensis, P. myzomelae,** and *P. gliciphilae;** and (*ii*) podonotal shield truncate: *P. lymozemae,* P. stomioperae,* P. thymanzae,** and *P. meliphagae.** In addition to this posterior truncation, there is also a lateral reduction of the podonotal shield in some species, leaving free accessory shieldlets. This occurs in both sequences, the species concerned being *P. gliciphilae, P. thymanzae,* and *P. meliphagae* (see note on *P. echinatus* above). As the honeyeaters are often gregarious, and several species may be seen feeding in the same flowering tree, strict host-specificity is not to be expected. Indeed, double infestations are not uncommon, see Section VII below. Thus *P. thymanzae* is known from eight species belonging to four genera, and *P. philemoni* from six species of four genera, though it should be noted that these genera are all toward the end of the sequence given by Leach (1958). Most of the remaining species are known from two, or occasionally three host-genera, but there is evidence that both *P. myzomelae* and *P. lymozemae* and restricted to *Myzomela* Vigors and Horsfield. The striking *P. balimoensis,* originally described from an unidentified meliphagid in New Guinea, occurs in *Meliphaga macleayana* in Australia.

The isolated *P. nudus* keys out near the parasites of muscicapids, but is restricted to the introduced domestic sparrow (Fringillidae), and, like many of the species with a complete opisthonotal shield parasitic in other fringillids and ploceids, retains the metasternal setae.

P. sturnopastoris is a parasite of S. E. Asian and Australian sturnids.

*P. sphecotheris** and *P. trouessarti* are restricted to Australian oriolids, the former to the two species of *Sphecotheres* Vieillot and the latter to the two species of *Oriolus* Linnaeus. They have characteristically cordate podonotal shields, but key out separately because the postanal seta is absent in the former and present in the latter.

The imperfectly known *P. novaeguineae* was described from a paradiseid species which penetrates into Australia.

This leaves *P. cerchneis,* a characteristic and widespread species restricted to the genus *Falco* Linnaeus (Falconiformes). It is perhaps related to the group of species from neotropical falconiforms detailed by Pereira and de Castro (1949) and Fain and Johnston (1966).

(*h*) *Sternostoma*

The members of this nondescript and difficult genus, unlike the preceding one (*Ptilonyssus*), show no predilection for passeriform hosts, and host-specificity is normally above the familial level. *S. thienponti* is common in Australian cracticids, although the only previous records are from African and Asian dicrurids. This finding is of interest, as Thomson (1964) notes that the relationships of the dicrurids are a "matter of speculation". The following four species are virtually cosmopolitan, or at least widespread in the Old World: *S. cooremani* in two coraciiform families, *S. boydi* in various charadriiforms, and *S. dureni* and *S. technaui* in turdids.

S. cuculorum has numerous hosts, among which cuculids and muscicapids figure prominently. Of the three recorded cuculid hosts, *Cacomantis variolosus* usually chooses birds that build open, cup-shaped nests in small trees *etc.,* particularly muscicapids, as foster-parents, and Cayley (1963) notes that the remaining three Australian hosts also build cup-shaped nests.

C. pyrrhophanus, on the other hand, prefers hosts which build a domed nest near the ground, while the larger *Eudynamys orientalis* prefers the nests of orioles and large meliphagids. If I have not over-simplified my concept of *S. cuculorum,* these findings differ from those of Strandtmann and Furman (1956) and Clark (1963), who found that, in the parasitic American cowbirds (Icteridae, Passeriformes), "host specificity of nasal mites is operative even in the face of ample opportunities for cross transmission of parasites".

S. tracheacolum, a pest in aviaries, particularly of fringillids and ploceids, tends to spread to unusual hosts in these circumstances. It has also been recorded from a wide range of small passeriforms in the wild (Fain and Hyland, 1962*a*). *S. paddae,* known only from the original record, is associated with conjunctivitis in an Oriental ploceid, and *S. cryptorhynchum* is widespread in the house-sparrow.

The remaining three species (*S. gliciphilae,* S. neosittae,** and *S. fulicae*) have not been collected since the original series. The first is the only species of the genus recorded from a peculiarly Australian host family (Meliphagidae), but the second may be expected to occur in other sittids overseas. The third is a parasite of the coot (Rallidae).

(*i*) *Boydaia*

This large genus, unlike the remaining three speleognathine genera discussed below, is essentially restricted to passeriform hosts, although, of the Australian species, *B. falconis* is widespread in the genus *Falco*. *B. spatulata* and *B. crassipes* are both widespread parasites of a variety of hosts, but *B. sturni, B. zosteropis,* and *B. hirundoae,* though widespread, are restricted to sturnids, zosteropids, and hirundinids, respectively. *B. myzomelae** and *B. maluri** are newly described from two peculiarly Australian groups, the Meliphagidae and Malurinae (Sylviidae).

(*j*) *Neoboydaia*

The five Australian members of this genus (*N. philomachi, N. psittaculae, N. aureliani, N. merops,* and *N. colymbiformi*) are all widespread, showing a low level of host-specificity for five different non-passeriform orders (Charadrii-, Psittaci-, Strigi-, Coracii-, and Podicipiformes, respectively).

(*k*) *Ophthalmognathus*

O. schoutedeni is widespread in ardeids, and *O. striatus* in columbids. *O. accipitris,** newly described from an Australian accipitrid, may also have a wider range.

(*l*) *Speleognathopsis*

S. benoiti is a widespread parasite of various charadriiforms, while *S. galli* and *S. porphyrionis** are known, as yet, only from galliforms in Africa and a gruiform in Australia, respectively.

(*m*) *Turbinoptes*

T. strandtmanni is a widespread parasite of various charadriiforms.

(*n*) *Passerrhinoptes*

*P. pomatostomi** is known only from an Australian timaliid, but may extend, with this family, as far as Africa.

(*o*) *Oxleya**

*O. podargi** was described from an Australian caprimulgiform, which, however, extends into the Orient.

(*p*) *Schoutedenocoptes*

S. numidae is known only from a domesticated numidid.

(*q*) *Rhinoptes*

R. gallinae was also described fròm a domesticated phasianid, but also occurs wild in an Australian member of the same host-family.

(*r*) *Mycteroptes*

M. basilewskyi is widespread in coraciids.

In conclusion, the anatomy of all birds is very similar, and their relatively recent emergence, their low rate of extinction, and their poor fossil record have further contributed to the difficulty in providing a classification and a detailed history of the phylogeny of the various bird orders.

The birds began to diverge from reptilian stock in the late Jurassic (150 million years ago), shortly after the emergence of the first mammals, but the earliest line (the Archaeornithes, which included only *Archaeopteryx* Meyer) is long extinct.

The Neornithes, which include the remaining fossil groups as well as all living birds, arose in the Cretaceous (120 m. years ago), and even by this time some birds had evolved which can be referred to orders still extant. During the Tertiary, the birds (and the mammals) gained ascendancy over the reptiles, and most of the orders, both of land-and water-birds, evolved (Eocene, 50 m. years ago), modern genera began to appear (Oligocene-Miocene, 35–25 m. years ago), and many modern species were already present (Pliocene, 10 m. years ago).

Both groups of modern birds are cosmopolitan. The palaeognaths (or flightless ratites) include only the ostrich of Africa and (formerly) S. W. Asia, the emu and cassowaries of Australia and New Guinea, the kiwis and recently extinct moas of New Zealand, the rheas of South America, *etc.* To the best of my knowledge, the only ratites examined for nasal mites are three emus (*Dromaius* Vieillot) (*v. infra*) and two cassowaries (*Casuarius* Brisson) (Wilson, personal communication). All were uninfested. The neognaths therefore include all the known hosts of nasal mites. They comprise all the remaining orders, but, as noted above, it is difficult to classify a group so diverse as to include the tinamous, penguins, grebes, petrels, ducks, hawks, pigeons, parrots, owls, swifts, *etc.* on the one hand, not to mention the equally large series of passeriform families on the other (Young, 1950; Thomson, 1964).

It seems clear, therefore, that mites of three suborders entered the nasal cavities of birds at an early period, and spread with their hosts, so that such widely differing groups of birds as grebes, herons, swallows, larks, *etc.* now bear their own distinctive mites throughout their cosmopolitan ranges. The same is true of groups confined to the Old World, even in the case of families possessing numerous species in Africa and Asia that are represented in Australia only by one. The Coraciidae, Meropidae, Nectariniidae, Sturnidae, and Dicruridae come immediately to mind, and all have carried their specific parasite(s) into Australia. A similar situation occurs even with such introduced species as the starling and house-sparrow, and this conservatism is opposed only by the parasites of groups of birds, like the meliphagids, that have been free to radiate in isolation at the end of this chain in Australia.

VI. PHYLOGENY OF THE RHINONYSSINE GENERA

Although no firm relationship with other arachnids can be established from the meagre fossil record, mites have been reported from the Devonian and Carboniferous, while, by the Tertiary, all the principal families are represented, particularly in amber (Woolley, 1961). Vitzthum's concept (1935, 1942) of the Dermanyssidae (then included in the Laelapidae) as primitively humus-dwelling predators, various lines of which became paraphages of insects, nidophiles, ectoparasites, and finally endoparasites of a wide range of vertebrate hosts, was maintained by Zumpt and Patterson (1951), and Evans and Till (1966) have recently retreated the matter in detail.*

It therefore seems reasonable to look for the primitive hosts of the Rhinonyssinae among the land-birds. The simplest species of *Tinaminyssus* (those retaining two well developed dorsal shields) are, indeed, those from pigeons, hawks, and parrots, the one exception, *T. belopolskii,* being a parasite of herons. The tritosternum, another structure quickly lost in an endoparasitic group, is also retained in some species from parrots. Some fragmentation, or occasionally the disappearance of the opisthonotal shield takes place in other species from hawks and parrots, and the species from tinamous (neotropical ground-birds) also show a divided opisthonotal shield. The species of *Tinaminyssus* from kingfishers generally lack the opisthonotal shield, as do those of the related genera *Larinyssus* and *Rallinyssus, T. tanysipterae* (Wilson, 1966*a*), n. comb., and *R. amaurornis* Wilson (1965) being exceptions. *Larinyssus* is restricted to various waders and *Rallinyssus* to rails. The latter, because of its peculiarly displaced stigmata and anal *accoutrements*, is presumably the more evolved. The fragmentation of the dorsal shield in these two genera extends to the podonotal shield, and this is to be correlated with the decreasing danger of desiccation and anoxia in the nasal passages of fresh-water and marine birds. The genus *Rhinonyssus,* in which the peritremes (porous anterior extensions of the respiratory stigmata) are lost, closes this line of evolution. The simpler species of this genus are parasites of penguins and a wide variety of waders, but one compact species-group with peculiarly modified palpi is found both in ducks and grebes (Strandtmann, 1959). It should be noted, however, that penguins are much closer to the Procellariiformes (petrels, albatrosses, *etc.*) than to the waders, and that the grebes are not ducklings, as I have heard bushmen heatedly affirm. In this case, the gregarious habits of the hosts in salt- and fresh-water are more important in determining host-specificity than true phylogenetic relationships (Strandtmann, 1958). To recapitulate, in this series of four small genera, all with unmodified chelicerae, the movement has been towards, and not away from water-birds.

A second line of development is to be seen in the two small genera *Ruandanyssus* and *Rhinoecius,* in which the fixed cheliceral digit has been lost, leaving a falcate movable digit of moderate length. The former parasitizes a range of passeriform birds, while the latter is restricted to owls.

A third line is characterized by a considerable reduction in size of the cheliceral digits, with a concomitant attenuation of the distal half of the cheliceral shafts (the seemingly bulbous, but normally developed basal portion is drawn out ventrally to form this slender portion). The species of *Ptilonyssus* which have retained two large dorsal shields and (often)

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*The classification of the two other groups of nasal mites of birds is still fluid. The Ereynetidae are divided by Fain (1962*d*) into the Ereynetinae (essentially free-living predators, but including one ectoparasite of pulmonate gastropods and one intranasal parasite of a Malaysian bird, see Fain, 1964*e*, and Fain and Nadchatram, 1962), the Lawrencarinae (intranasal parasites of frogs), and the Speleognathinae (intranasal parasites of warm-blooded vertebrates). The turbinoptines are close relatives of epidermoptine genera which scavenge on the skin *débris* of birds.

metasternal setae are principally parasites of small granivores, while the remainder have radiated, and are still radiating among a wide range of passeriforms. An occassional species of this very large genus has been recorded from non-passeriforms (hawks, swifts, nightjars, and bee-eaters), but none is known from water-birds. The species of *Sternostoma,* found as a rule deeper in the nasal tract, have lost their peritremes, and one, with a reduced opisthonotal shield, is found in waders. The remainder are parasites particularly of passeriforms, but, rather more frequently than is the case with *Ptilonyssus,* also of non-passeriform groups.

These three lines are the subfamilies Rhinonyssinae, Rhinoeciinae, and Ptilonyssinae discussed, and abandoned in Section IV above, together with Bregetova's theory (1964) of a diphyletic origin of the rhinonyssines. Indeed, the rhinonyssines with a well developed tritosternum are so little differentiated from some of the ectoparasites of mammals and birds, *e.g. Ornithonyssus* Sambon and *Pellonyssus* Clark and Yunker, that Zumpt and Till (1961) placed *Ruandanyssus* and *Astridiella* (here considered a synonym of *Ptilonyssus*) among the macronyssine rather than the rhinonyssine genera. If a distinction must be maintained between the Macronyssinae and the Rhinonyssinae, it can be made only on ecological grounds, because the presence or absence of the tritosternum is useless as a taxonomic character, as discussed above in the synonymies of *Tinaminyssus, Rhinoecius,* and *Ptilonyssus.* Indeed, even this ecological separation is weakened by the habits of some related species. The tropical fowl-mite, *Ornithonyssus bursa* (Berlese) (Macronyssinae), unlike the northern fowl-mite, *O. sylviarum* (Canestrini and Fanzago), does not spend its whole time on its host (Furman, 1963), and the chicken-mite, *Dermanyssus gallinae* (Degeer) (Dermanyssinae) feeds only for one or two hours at night, spending the rest of the day in crevices in fowlhouses (Kirkwood, 1963). Such behaviour undoubtedly led to the entry of "protorhinonyssines" into the intricate, warm, and moist nasal passages of birds. I therefore believe the Rhinonyssinae to be a monophyletic unit clearly derived, and separable only with difficulty from the Macronyssinae, the former name having priority.

VII. Host-parasite List

As the revision of the official checklist of Australian birds (Leach *et al.,* 1926) has not yet been completed, I have used the classification of Leach (1958)* in the present study. This authority lists 735 species, 330 genera, 82 families, and 20 orders (including 11 genera and 17 species of introduced and vagrant birds), while an unpublished checklist of Queensland birds on a similar basis (Lavery, personal communication) lists 570 species and 280 genera. It is therefore clear that, since Queensland, of all the states, has by far the largest proportion of the birds on the Commonwealth list (78% of the species, and 85% of the genera), an intensive study of the fauna of that state will have relevance beyond its borders. Leach's system is summarized in Tables 2 and 3, with an indication of the fauna still to be examined. However, as with many of Australia's rarer marsupials, it is unlikely that some groups, *e.g.* night parrots (*Geopsittacus* Gould) and scrub-birds (*Atrichornis* Stejneger), will ever be thoroughly examined for parasites.

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*As I am not a bird taxonomist, I have accepted uncritically the Latin names of this authority, although several are obviously in error. Thus, while the use of adjectival specific names with masculine terminations (*pyrrhopygius, sanctus*) in the feminine genus *Halcyon* contravenes Art. 30, the original spelling of the specific name *tenuirostris,* not being adjectival, stands under Art. 32, and cannot be forced into a neuter form on its transferal to *Edoliisoma* Pucheran. I have, however, dispensed with the hyphen in specific names such as *novaehollandiae* (Art. 32).

I have examined just over half (287 species) of the Queensland total, while another 43 widespread species known to be infested overseas have not yet been so found in Australia (some of this latter group occur in Queensland; others do not). Of those I have examined, 158 species (55%) were infested (of which eight are likely to yield still further mite species), while a further 51 species can be expected to yield nasal mites. In total, 330 species are known to have been examined, of which nasal mites have been recorded from 209 (63%).

TABLE 2

Analysis of Australian and Queensland genera and species of birds examined and found infested with nasal mites

Order	Number of Genera				Number of Species			
	Australia	Queensland*	Examined	Infested	Australia	Queensland*	Examined	Infested
Casuariiformes	2	2	1	0	2	2	1	0
Galliformes	8	6	5	3	9	7	5	3
Turniciformes	2	2	1	0	8	7	1	0
Columbiformes	17	14	12	12	27	22	17	16
Gruiformes	12	10	9	7	16	15	9	7
Podicipiformes	1	1	1	1	3	3	1	1
Sphenisciformes	3	1	1	1	5	1	1	1
Procellariiformes	16	12	0	0	37	26	0	0
Charadriiformes	38	32	28	20	76	75	44	31
Ciconiiformes	14	12	11	5	20	21	17	7
Anseriformes	15	12	8	4	22	18	11	7
Pelecaniformes	6	6	4	0	15	14	6	0
Falconiformes	14	14	8	3	26	24	12	4
Strigiformes	2	2	2	2	9	8	4	2
Psittaciformes	23	19	13	12	58	36	20	14
Caprimulgiformes	4	4	3	2	8	7	3	2
Coraciiformes	7	7	5	4	12	12	10	8
Apodiformes	3	3	0	0	3	5	0	0
Cuculiformes	7	7	6	2	14	12	8	3
Passeriformes	136	114	93	72	365	255	160	103
Total	330	280	211	150	735	570	330	209
Percentage :								
Australia	100	85	64	45	100	78	45	28
Queensland	—	100	75	53	—	100	58	36
Examined	—	—	100	71	—	—	100	62

* Lavery's figures (personal communication) for the Galliformes, Turniciformes, Gruiformes, and Charadriiformes have been adjusted to conform to Leach's order (1958) to facilitate comparison of the two sets of figures.

The number of individual host-parasite records, however, is somewhat larger. My own collections have yielded 205 such records (Rhinonyssinae from 175, Speleognathinae from 23, and Turbinoptinae from 7 hosts), and, taking into account birds on the Australian list that are known to be infested overseas, this number may be increased to 295 (Rhinonyssinae from 248, Speleognathinae from 37, and Turbinoptinae from 10 hosts). These figures are neither maximal nor minimal, since some birds examined in small numbers only will probably prove later to be infested, while others, of which only a single specimen has been examined, have proved infested (with, in at least one case, *Oreocincla lunulata,* two species of mites).

The reason for this difference is that one host-species may harbour two or more species of mites, and, in fact, 30 hosts are known, in Australia, to harbour two, seven three, and one four parasites. However, no multiple infestations were noted in the present study, but the following 22 cases of natural double infestations occurred, 14 involving two rhinonyssine species,

TABLE 3

Synopsis of genera and species of Australian birds examined and found infested with nasal mites

Order	Family	Number of Genera			Number of Species		
		Total	Examined	Infested	Total	Examined	Infested
Casuariiformes	Dromaiidae	1	1	0	1	1	0
	Casuariidae	1	0	0	1	0	0
Galliformes	Megapodiidae	3	2	0	3	2	0
	Phasianidae	4	2	2	5	2	2
	Numididae	1	1	1	1	1	1
Turniciformes	Turnicidae	1	1	0	7	1	0
	Pedionomidae	1	0	0	1	0	0
Columbiformes	Columbidae	17	12	12	27	17	16
Gruiformes	Rallidae	11	8	7	15	8	7
	Megalornithidae	1	1	0	1	1	0
Podicipiformes	Podicipidae	1	1	1	3	1	1
Sphenisciformes	Spheniscidae	3	1	1	5	1	1
Procellariiformes	Hydrobatidae	5	0	0	5	0	0
	Procellariidae	8	0	0	24	0	0
	Pelecanoididae	1	0	0	1	0	0
	Diomedeidae	2	0	0	7	0	0
Charadriiformes	Laridae	6	4	4	21	8	7
	Stercorariidae	2	0	0	3	0	0
	Haematopodidae	1	1	0	2	1	0
	Charadriidae	8	7	6	16	10	9
	Recurvirostridae	3	2	1	3	2	1
	Scolopacidae	11	9	7	24	18	12
	Rostratulidae	1	0	0	1	0	0
	Jacanidae	1	1	0	1	1	0
	Glareolidae	2	2	2	2	2	2
	Burhinidae	2	1	0	2	1	0
	Otitidae	1	1	0	1	1	0
Ciconiiformes	Threskiornithidae	3	3	0	5	5	0
	Ciconiidae	1	1	0	1	1	0
	Ardeidae	10	7	5	14	11	7
Anseriformes	Anatidae	15	8	4	22	11	7
Pelecaniformes	Phalacrocoracidae	1	1	0	5	3	0
	Anhingidae	1	1	0	1	1	0
	Sulidae	1	1	0	4	1	0
	Fregatidae	1	0	0	2	0	0
	Phaethontidae	1	0	0	2	0	0
	Pelecanidae	1	1	0	1	1	0
Falconiformes	Accipitridae	12	7	2	18	9	2
	Falconidae	1	1	1	7	3	2
	Pandionidae	1	0	0	1	0	0
Strigiformes	Strigidae	1	1	1	4	2	1
	Tytonidae	1	1	1	5	2	1
Psittaciformes	Psittacidae	23	13	12	58	20	14
Caprimulgiformes	Podargidae	1	1	1	4	1	1
	Aegothelidae	1	1	0	1	1	0
	Caprimulgidae	2	1	1	3	1	1
Coraciiformes	Coraciidae	1	1	1	1	1	1
	Alcedinidae	5	3	2	10	8	6
	Meropidae	1	1	1	1	1	1
Apodiformes	Apodidae	3	0	0	3	0	0
Cuculiformes	Cuculidae	7	6	2	14	8	3
Passeriformes	Menuridae	1	0	0	2	0	0
	Pittidae	1	1	1	3	1	1
	Atrichornithidae	1	0	0	2	0	0
	Hirundinidae	3	3	2	5	5	4
	Muscicapidae	16	11	10	37	18	15
	Campophagidae	4	4	2	9	9	3
	Timaliidae	5	2	2	14	2	2
	Sylviidae	21	9	5	78	22	6

TABLE 3—*Continued*

Synopsis of genera and species of Australian birds examined and found infested with nasal mites—Continued

Order	Family	Number of Genera			Number of Species		
		Total	Ex-amined	In-fested	Total	Ex-amined	In-fested
Passeriformes	Artamidae	1	1	1	6	5	3
	Grallinidae	1	1	1	1	1	1
	Pachycephalidae	2	2	2	17	5	5
	Falcunculidae	3	3	2	6	3	2
	Turdidae	4	3	2	8	4	3
	Pycnonotidae	1	0	0	1	0	0
	Cracticidae	3	3	3	14	6	6
	Paridae	2	0	0	5	0	0
	Sittidae	1	1	1	6	3	1
	Certhiidae	1	1	1	9	3	1
	Zosteropidae	1	1	1	4	1	1
	Dicaeidae	2	2	1	9	5	1
	Nectariniidae	1	1	1	1	1	1
	Meliphagidae	23	13	11	69	25	21
	Motacillidae	2	2	2	2	2	2
	Alaudidae	2	1	1	2	1	1
	Fringillidae	4	4	4	5	5	5
	Ploceidae	13	10	5	23	12	5
	Sturnidae	3	3	3	3	3	3
	Oriolidae	2	2	2	4	4	4
	Dicruridae	1	1	1	1	1	1
	Paradiseidae	2	1	1	4	3	1
	Ptilonorhynchidae	6	4	2	10	6	2
	Corvidae	3	3	2	5	4	2

and eight one rhinonyssine and one speleognathine species (turbinoptines were never involved): *Tinaminyssus myristicivorae* and *T. welchi* from *Myristicivora spilorrhoa; Rhinonyssus minutus* and *Speleognathopsis benoiti* from *Charadrius melanops* (twice); *Ruandanyssus terpsiphonei* and *Ptilonyssus struthideae* from *Struthidea cinerea; Ruandanyssus terpsiphonei* and *Sternostoma cuculorum* from *Myiagra rubecula; Ptilonyssus triscutatus* and *Neoboydaia merops* from *Merops ornatus; Ptilonyssus dioptrornis* and *Sternostoma cuculorum* from *Eopsaltria capito; Ptilonyssus cractici* and *Sternostoma thienponti* from *Gymnorhina tibicen; Ptilonyssus terpsiphonei* and *Sternostoma cuculorum* from *Arses kaupi; Ptilonyssus monarchae* and *Sternostoma cuculorum* from *Monarcha trivirgata; Ptilonyssus ruandae* and *Sternostoma zosteropis* from *Zosterops lateralis; Ptilonyssus myzanthae* and *P. thymanzae* from *Myzantha melanocephala* (four times); *Ptilonyssus myzanthae* and *P. thymanzae* from *Myzantha flavigula; Ptilonyssus philemoni* and *Boydaia spatulata* from *Philemon corniculatus; Ptilonyssus gliciphilae* and *Boydaia spatulata* from *Myzomela pectoralis; Ptilonyssus lymozemae* and *Boydaia myzomelae* from *Myzomela sanguinolenta; Ptilonyssus cerchneis* and *Boydaia falconis* from *Falco berigora* (twice); and *Sternostoma dureni* and *S. technaui* from *Oreocincla lunulata.*

The complete host-parasite list occupies Table 4 below, in which the following typographical conventions have been used: (*i*) asterisks indicate birds known to occur in Australia as introductions or vagrants, but not listed in Leach (1958); (*ii*) scientific names of birds printed in roman rather than in italics indicate species not examined in the present survey; and (*iii*) scientific names of mites similarly printed indicate host-parasite relationships established overseas, but not yet noted in Australia.

TABLE 4

List of Australian birds examined and their recorded nasal mite parasites

	Casuariiformes Dromaiidae	
Dromaius novaehollandiae (Latham)	Emu	
	Galliformes Megapodiidae	
Megapodius freycinet Gaimard	Scrub-fowl	
Alectura lathami Gray	Brush-turkey	
	Phasianidae	
Gallus gallus (Linnaeus)*	Domestic fowl	Speleognathopsis galli Rhinoptes gallinae
Synoicus australis (Latham)	Brown quail	*Rhinoptes gallinae*
	Numididae	
Numida meleagris (Linnaeus)*	Guinea-fowl	Speleognathopsis galli Schoutedenocoptes numidae
	Turniciformes Turnicidae	
Turnix varia (Latham)	Painted quail	
	Columbiformes Columbidae	
Ptilinopus regina Swainson	Red-crowned pigeon	
Ptilinopus superbus (Temminck)	Purple-crowned pigeon	Tinaminyssus ptilinopi
Megaloprepia magnifica (Temminck)	Wompoo pigeon	*Tinaminyssus megaloprepiae*
Myristicivora spilorrhoa (Gray)	Torres Strait pigeon	*Tinaminyssus myristicivorae* *Tinaminyssus welchi*
Columba livia Gmelin*	Domestic pigeon	*Tinaminyssus melloi* Tinaminyssus columbae Ophthalmognathus striatus
Columba norfolciensis Latham	White-headed pigeon	*Tinaminyssus melloi*
Macropygia phasianella (Temminck)	Brown pigeon	*Tinaminyssus macropygiae*
Streptopelia chinensis (Scopoli)	Indian turtle-dove	*Tinaminyssus melloi*
Streptopelia senegalensis (Linnaeus)	Senegal dove	Tinaminyssus melloi
Geopelia placida Gould	Peaceful dove	*Tinaminyssus geopeliae*
Geopelia cuneata (Latham)	Diamond-dove	*Tinaminyssus geopeliae*
Geopelia humeralis (Temminck)	Bar-shouldered dove	*Tinaminyssus geopeliae*
Chalcophaps chrysochlora (Wagler)	Green-winged pigeon	*Tinaminyssus hirtus*
Phaps chalcoptera (Latham)	Common bronzewing	*Tinaminyssus phabus*
Geophaps scripta (Temminck)	Squatter-pigeon	*Tinaminyssus ocyphabus*
Ocyphaps lophotes (Temminck)	Crested pigeon	*Tinaminyssus ocyphabus* *Tinaminyssus columbae*
Leucosarcia melanoleuca (Latham)	Wonga pigeon	*Tinaminyssus melloi*
	Gruiformes Rallidae	
Rallus pectoralis Temminck	Lewin water-rail	Rallinyssus gallinulae
Hypotaenidia philippensis (Linnaeus)	Banded landrail	*Rallinyssus gallinulae*
Porzana tabuensis (Gmelin)	Spotless crake	Rallinyssus congolensis
Poliolimnas cinereus (Vieillot)	White-browed crake	Rallinyssus amaurornis
Amaurornis ruficrissus (Gould)	Bushhen	
Gallinula tenebrosa Gould	Dusky moorhen	*Rallinyssus caudistigmus*
Porphyrio melanotus Temminck	Eastern swamphen	Rallinyssus gallinulae *Speleognathopsis porphyrionis*
Fulica atra Linnaeus	Coot	Rallinyssus caudistigmus Sternostoma fulicae
	Megalornithidae	
Grus rubicundus (Perry)	Brolga	

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

	Podicipiformes Podicipidae	
Podiceps ruficollis (Vroeg)	Little grebe	*Rhinonyssus poliocephali* *Neoboydaia colymbiformi*
	Sphenisciformes Spheniscidae	
Pygoscelis adeliae (Hombron and Jacquinot)*	Adélie penguin	Rhinonyssus sphenisci
	Charadriiformes Laridae	
Chlidonias hybrida (Pallas)	Whiskered tern	
Chlidonias leucoptera (Temminck)	White-winged black tern	Larinyssus orbicularis Sternostoma boydi
Gelochelidon nilotica (Gmelin)	Gull-billed tern	Larinyssus orbicularis
Sterna hirundo Linnaeus	Common tern	Larinyssus orbicularis
Sterna bergii Lichtenstein	Crested tern	*Larinyssus orbicularis*
Sterna fuscata Linnaeus	Sooty tern	Larinyssus orbicularis Sternostoma boydi
Larus novaehollandiae Stephens	Silver gull	*Turbinoptes strandtmanni*
Larus dominicanus Lichtenstein*	Southern black-backed gull	Larinyssus orbicularis
	Haematopodidae	
Haematopus ostralegus Linnaeus	Pied oystercatcher	
	Charadriidae	
Arenaria interpres (Linnaeus)	Turnstone	Rhinonyssus coniventris Sternostoma boydi
Erythrogonys cinctus Gould	Red-kneed dotterel	*Rhinonyssus himantopus* *Speleognathopsis benoiti*
Lobibyx novaehollandiae (Stephens)	Spur-winged plover	*Rhinonyssus himantopus*
Lobibyx miles (Boddaert)	Masked plover	*Rhinonyssus himantopus* *Speleognathopsis benoiti*
Zonifer tricolor (Vieillot)	Banded plover	
Squatarola squatarola (Linnaeus)	Grey plover	Rhinonyssus coniventris Speleognathopsis benoiti
Pluvialis dominicus (Müller)	Eastern golden plover	Rhinonyssus minutus Rhinonyssus coniventris
Charadrius alexandrinus Linnaeus	Red-capped dotterel	*Rhinonyssus minutus* *Rhinonyssus coniventris*
Charadrius melanops Vieillot	Black-fronted dotterel	*Rhinonyssus himantopus* *Speleognathopsis benoiti*
Charadrius hiaticula Linnaeus*	Ringed plover	Rhinonyssus minutus Rhinonyssus coniventris
	Recurvirostridae	
Himantopus leucocephalus Gould	White-headed stilt	*Rhinonyssus himantopus*
Recurvirostra novaehollandiae Vieillot	Red-necked avocet	
	Scolopacidae	
Numenius madagascarensis (Linnaeus)	Eastern curlew	*Turbinoptes strandtmanni*
Numenius phaeopus (Linnaeus)	Whimbrel	*Turbinoptes strandtmanni*
Mesoscolopax minutus (Gould)	Little whimbrel	
Limosa lapponica (Linnaeus)	Bar-tailed godwit	*Neoboydaia philomachi*
Limosa limosa (Linnaeus)	Black-tailed godwit	
Tringa hypoleuca Linnaeus	Common sandpiper	Sternostoma boydi Turbinoptes strandtmanni
Tringa brevipes (Vieillot)	Grey-tailed tattler	
Tringa glareola Linnaeus	Wood-sandpiper	Rhinonyssus coniventris Sternostoma boydi Neoboydaia philomachi
Tringa nebularia (Gunnerus)	Greenshank	*Rhinonyssus rhinolethrum* Sternostoma boydi

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

Crocethia alba (Vroeg)	Sanderling	Rhinonyssus coniventris Sternostoma boydi
Erolia ruficollis (Pallas)	Red-necked stint	*Rhinonyssus coniventris*
Erolia acuminata (Horsfield)	Sharp-tailed sandpiper	
Erolia melanotos (Vieillot)	American pectoral sandpiper	Neoboydaia philomachi
Erolia ferruginea (Brunnich)	Curlew-sandpiper	
Erolia alpina (Linnaeus)*	Dunlin	Rhinonyssus coniventris
Calidris canutus (Linnaeus)	Knot	Rhinonyssus coniventris Sternostoma boydi
Gallinago hardwickii (Gray)	Australian snipe	
Philomachus pugnax (Linnaeus)*	Ruff	Neoboydaia philomachi
	Jacanidae	
Irediparra gallinacea (Temminck)	Lotus-bird	
	Glareolidae	
Stiltia isabella (Vieillot)	Australian pratincole	*Larinyssus benoiti*
Glareola pratincola (Linnaeus)	Oriental pratincole	Larinyssus benoiti
	Burhinidae	
Burhinus magnirostris (Latham)	Southern stone-curlew	
	Otitidae	
Eupodotis australis (Gray)	Australian bustard	
	Ciconiiformes	
	Threskiornithidae	
Threskiornis molucca (Cuvier)	Australian white ibis	
Threskiornis spinicollis (Jameson)	Straw-necked ibis	
Plegadis falcinellus (Linnaeus)	Glossy ibis	
Platalea regia Gould	Royal spoonbill	
Platalea flavipes Gould	Yellow-billed spoonbill	
	Ciconiidae	
Xenorhynchus asiaticus (Latham)	Jabiru	
	Ardeidae	
Egretta intermedia (Wagler)	Plumed egret	Tinaminyssus belopolskii
Egretta alba (Linnaeus)	White egret	
Egretta garzetta (Linnaeus)	Little egret	Tinaminyssus belopolskii
Bubulcus ibis (Linnaeus)*	Cattle egret	Tinaminyssus belopolskii
Notophoyx novaehollandiae (Latham)	White-faced heron	*Tinaminyssus belopolskii*
Notophoyx pacifica (Latham)	White-necked heron	
Notophoyx picata (Gould)	Pied heron	*Tinaminyssus belopolskii*
Demigretta sacra (Gmelin)	Reef-heron	
Nycticorax caledonicus (Gmelin)	Nankeen night heron	*Ophthalmognathus schoutedeni*
Butorides striata (Linnaeus)	Mangrove-heron	
Ixobrychus minutus (Linnaeus)	Little bittern	Tinaminyssus belopolskii
	Anseriformes	
	Anatidae	
Anser anser (Linnaeus)*	Domestic goose	Rhinonyssus rhinolethrum
Anseranas semipalmata (Latham)	Pied goose	
Nettapus pulchellus Gould	Green pigmy goose	
Chenonetta jubata (Latham)	Maned goose	*Rhinonyssus rhinolethrum*
Dendrocygna arcuata (Horsfield)	Whistling tree-duck	*Rhinonyssus rhinolethrum*
Tadorna radjah (Garnot)	White-headed shelduck	
Anas superciliosa Gmelin	Black duck	Rhinonyssus rhinolethrum
Anas querquedula Linnaeus	Garganey teal	Rhinonyssus rhinolethrum
Anas gibberifrons (Müller)	Grey teal	*Rhinonyssus rhinolethrum*
Anas platyrhynchos Linnaeus*	Mallard	Rhinonyssus rhinolethrum
Aythya australis (Eyton)	Hardhead	

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

	Pelecaniformes	
	Phalacrocoracidae	
Phalacrocorax sulcirostris (Brandt)	Little black cormorant	
Phalacrocorax varius (Gmelin)	Pied cormorant	
Phalacrocorax melanoleucus (Vieillot)	Little pied cormorant	
	Anhingidae	
Anhinga novaehollandiae (Gould)	Australian darter	
	Sulidae	
Sula dactylatra Lesson	Masked gannet	
	Pelecanidae	
Pelecanus conspicillatus Temminck	Australian pelican	
	Falconiformes	
	Accipitridae	
Accipiter novaehollandiae (Gmelin)	Grey goshawk	
Accipiter fasciatus (Vigors and Horsfield)	Australian goshawk	*Ophthalmognathus accipitris*
Accipiter cirrocephalus (Vieillot)	Collared sparrow hawk	
Aquila audax (Latham)	Wedge-tailed eagle	
Haliaeetus leucogaster (Gmelin)	White-breasted sea-eagle	
Haliastur sphenurus (Vieillot)	Whistling eagle	
Milvus migrans (Boddaert)	Black kite	
Elanus notatus Gould	Australian black-shouldered kite	
Aviceda subcristata (Gould)	Crested hawk	Tinaminyssus epileus
	Falconidae	
Falco longipennis Swainson	Little falcon	
Falco berigora Vigors and Horsfield	Brown hawk	*Ptilonyssus cerchneis* *Boydaia falconis*
Falco cenchroides Vigors and Horsfield	Nankeen kestrel	*Ptilonyssus cerchneis*
	Strigiformes	
	Strigidae	
Ninox novaeseelandiae (Gmelin)	Boobook owl	*Rhinoecius cooremani*
Ninox connivens (Latham)	Winking owl	
	Tytonidae	
Tyto alba (Scopoli)	Barn-owl	Rhinoecius tytonis Neoboydaia aureliani
Tyto novaehollandiae (Stephens)	Masked owl	
	Psittaciformes	
	Psittacidae	
Agapornis roseicollis (Vieillot)*	Peach-faced lovebird	Neoboydaia psittaculae
Trichoglossus moluccanus (Gmelin)	Rainbow-lorikeet	*Tinaminyssus trichoglossi* *Neoboydaia psittaculae*
Trichoglossus chlorolepidotus (Kühl)	Scaly-breasted lorikeet	*Tinaminyssus trichoglossi*
Psitteuteles versicolor (Lear)	Varied lorikeet	*Neoboydaia psittaculae*
Glossopsitta pusilla (Shaw)	Little lorikeet	*Tinaminyssus trichoglossi*
Calyptorhynchus banksii (Latham)	Red-tailed black cockatoo	*Tinaminyssus kakatuae*
Kakatoe galerita (Latham)	White cockatoo	
Kakatoe roseicapilla (Vieillot)	Galah	*Tinaminyssus kakatuae*
Kakatoe sanguinea (Gould)	Little corella	
Leptolophus hollandicus (Kerr)	Cockatiel	*Tinaminyssus kakatuae*
Aprosmictus scapularis (Lichtenstein)	King-parrot	*Tinaminyssus aprosmicti*
Aprosmictus erythropterus (Gmelin)	Red-winged parrot	*Tinaminyssus aprosmicti*
Platycercus elegans (Gmelin)	Crimson rosella	
Platycercus adscitus (Latham)	Pale-headed rosella	*Tinaminyssus aprosmicti*
Platycercus eximius (Shaw)	Eastern rosella	

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

Barnardius barnardi (Vigors and Horsfield)	Ring-neck parrot	*Tinaminyssus aprosmicti*
Psephotus varius Clark	Mulga parrot	*Tinaminyssus aprosmicti*
Psephotus haematonotus (Gould)	Red-backed parrot	*Tinaminyssus aprosmicti*
Neophema pulchella (Shaw)	Turquoise parrot	
Melopsittacus undulatus (Shaw)	Budgerygah	Sternostoma tracheacolum
	Caprimulgiformes Podargidae	
Podargus strigoides (Latham)	Tawny frogmouth	*Oxleya podargi*
	Aegothelidae	
Aegotheles cristata (Shaw)	Owlet-nightjar	
	Caprimulgidae	
Caprimulgus macrurus Horsfield	Large-tailed nightjar	Ptilonyssus nitzschi
	Coraciiformes Coraciidae	
Eurystomus orientalis (Linnaeus)	Eastern broad-billed roller	*Mycteroptes basilewskyi*
	Alcedinidae	
Alcyone azurea (Latham)	Azure kingfisher	
Alcyone pusilla (Temminck)	Little kingfisher	
Dacelo gigas (Boddaert)	Laughing kookaburra	*Tinaminyssus daceloae* *Ptilonyssus cractici* *Sternostoma cooremani*
Dacclo leachii Vigors and Horsfield	Blue-winged kookaburra	*Tinaminyssus daceloae*
Halcyon pyrrhopygius Gould	Red-backed kingfisher	*Tinaminyssus halcyonus*
Halcyon sanctus Vigors and Horsfield	Sacred kingfisher	*Tinaminyssus halcyonus*
Halcyon macleayii Jardine and Selby	Forest kingfisher	*Tinaminyssus halcyonus*
Halcyon chloris (Boddaert)	Mangrove-kingfisher	Tinaminyssus halcyonus Sternostoma cooremani
	Meropidae	
Merops ornatus Latham	Rainbow-bird	*Ptilonyssus triscutatus* *Sternostoma cooremani* *Neoboydaia merops*
	Cuculiformes Cuculidae	
Cuculus saturatus Blyth	Oriental cuckoo	
Cacomantis pyrrhophanus (Vieillot)	Fan-tailed cuckoo	*Sternostoma cuculorum*
Cacomantis variolosus (Vigors and Horsfield)	Brush cuckoo	*Sternostoma cuculorum*
Chalcites basalis (Horsfield)	Horsfield bronze-cuckoo	
Chalcites plagosus (Latham)	Golden bronze-cuckoo	
Scythrops novaehollandiae Latham	Channel-billed cuckoo	
Eudynamys orientalis (Linnaeus)	Koel	*Sternostoma cuculorum*
Centropus phasianinus (Latham)	Pheasant-coucal	
	Passeriformes Pittidae	
Pitta versicolor Swainson	Noisy pitta	*Ptilonyssus pittae*
	Hirundinidae	
Hirundo neoxena Gould	Welcome swallow	*Ptilonyssus angrensis* *Ptilonyssus echinatus* *Boydaia hirundoae*
Hirundo rustica Linnaeus*	Common swallow	Ptilonyssus emberizae Ptilonyssus echinatus Ptilonyssus langei Sternostoma tracheacolum Boydaia hirundoae

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

Cheramoeca leucosterna (Gould)	White-backed swallow	
Hylochelidon nigricans (Vieillot)	Tree-martin	*Ptilonyssus echinatus*
Hylochelidon ariel (Gould)	Fairy martin	*Boydaia hirundoae*
	Muscicapidae	
Microeca fascinans (Latham)	Jacky winter	*Ptilonyssus microecae*
Microeca flavigaster Gould	Lemon-breasted flycatcher	*Ptilonyssus microecae*
Petroica rosea Gould	Rose-robin	*Ptilonyssus motacillae*
Petroica goodenovii (Vigors and Horsfield)	Red-capped robin	
Melanodryas cucullata (Latham)	Hooded robin	
Rhipidura fuliginosa (Sparrman)	Grey fantail	*Ptilonyssus rhipidurae*
Rhipidura setosa (Quoy and Gaimard)	Northern fantail	*Ptilonyssus setosae*
Rhipidura rufifrons (Latham)	Rufous fantail	*Ptilonyssus setosae*
Rhipidura leucophrys (Latham)	Willie wagtail	*Ptilonyssus macclurei* *Sternostoma cuculorum*
Myiagra rubecula (Latham)	Leaden flycatcher	*Ruandanyssus terpsiphonei* *Ptilonyssus terpsiphonei* *Sternostoma cuculorum*
Seisura inquieta (Latham)	Restless flycatcher	*Ptilonyssus terpsiphonei*
Arses kaupi Gould	Australian pied flycatcher	*Ptilonyssus terpsiphonei* *Sternostoma cuculorum*
Piezorhynchus alecto (Temminck)	Shining flycatcher	*Ptilonyssus terpsiphonei*
Monarcha melanopsis (Vieillot)	Black-faced flycatcher	*Ptilonyssus terpsiphonei*
Monarcha trivirgata (Temminck)	Spectacled flycatcher	*Ruandanyssus terpsiphonei* *Ptilonyssus terpsiphonei* *Ptilonyssus monarchae* *Sternostoma cuculorum*
Carterornis leucotis (Gould)	White-eared flycatcher	*Ptilonyssus terpsiphonei*
Eopsaltria capito Gould	Pale-yellow robin	*Ptilonyssus dioptrornis* *Sternostoma cuculorum*
Eopsaltria chrysorrhoa Gould	Northern yellow robin	
	Campophagidae	
Pteropodocys maxima (Rüppell)	Ground cuckoo-shrike	
Coracina novaehollandiae (Gmelin)	Black-faced cuckoo-shrike	*Ruandanyssus terpsiphonei*
Coracina hypoleuca (Gould)	White - breasted cuckoo - shrike	
Coracina papuensis (Gmelin)	Papuan cuckoo-shrike	
Coracina lineata (Swainson)	Barred cuckoo-shrike	
Coracina robusta (Latham)	Little cuckoo-shrike	*Ruandanyssus terpsiphonei*
Edoliisoma tenuirostre (Jardine)	Jardine caterpillar-eater	
Lalage tricolor (Swainson)	White-winged triller	*Ruandanyssus terpsiphonei* *Ptilonyssus cractici* *Boydaia crassipes*
Lalage leucomela (Vigors and Horsfield)	Varied triller	
	Timaliidae	
Orthonyx temminckii Ranzani	Southern chowchilla	*Ptilonyssus orthonychus*
Pomatostomus temporalis (Vigors and Horsfield)	Grey-crowned babbler	*Passerrhinoptes pomatostomi*
	Sylviidae	
Smicrornis brevirostris (Gould)	Brown weebill	
Smicrornis flavescens Gould	Yellow weebill	
Gerygone olivacea (Gould)	White-throated warbler	
Gerygone fusca (Gould)	Western warbler	
Gerygone richmondii (Mathews)	Brown warbler	
Gerygone mouki Mathews	Northern warbler	
Gerygone palpebrosa Wallace	Black-throated warbler	*Ptilonyssus gerygonae*
Cinclorhamphus mathewsi Iredale	Rufous songlark	*Ptilonyssus bradypteri*
Acrocephalus australis (Gould)	Australian reed-warbler	*Ptilonyssus acrocephali* Sternostoma tracheacolum
Cisticola exilis (Vigors and Horsfield)	Fantail-warbler	
Chthonicola sagittata (Latham)	Speckled warbler	

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

Acanthiza pusilla (Shaw)	Brown thornbill	
Acanthiza uropygialis Gould	Chestnut-tailed thornbill	
Acanthiza chrysorrhoa (Quoy and Gaimard)	Yellow-tailed thornbill	
Acanthiza reguloides Vigors and Horsfield	Buff-tailed thornbill	
Sericornis lathami (Stephens)	Yellow-throated scrub-wren	
Sericornis frontalis (Vigors and Horsfield)	White-browed scrub-wren	*Ruandanyssus terpsiphonei*
Sericornis magnirostris (Gould)	Large-billed scrub-wren	
Malurus melanotus Gould	Black-backed blue wren	
Malurus lamberti Vigors and Horsfield	Variegated wren	
Malurus amabilis Gould	Lovely wren	*Boydaia maluri*
Malurus melanocephalus (Latham)	Red-backed wren	*Ptilonyssus maluri* *Boydaia maluri*
	Artamidae	
Artamus superciliosus (Gould)	White-browed wood-swallow	
Artamus personatus (Gould)	Masked wood-swallow	*Ruandanyssus terpsiphonei*
Artamus cyanopterus (Latham)	Dusky wood-swallow	
Artamus cinereus Gould	Black-faced wood-swallow	*Ruandanyssus artami*
Artamus minor Vieillot	Little wood-swallow	*Ruandanyssus artami*
	Grallinidae	
Grallina cyanoleuca (Latham)	Magpie-lark	*Ptilonyssus grallinae*
	Pachycephalidae	
Colluricincla harmonica (Latham)	Grey shrike-thrush	*Ptilonyssus colluricinclae*
Colluricincla megarhyncha (Quoy and Gaimard)	Rufous shrike-thrush	*Ptilonyssus colluricinclae* *Sternostoma cuculorum*
Pachycephala pectoralis (Latham)	Golden whistler	*Ruandanyssus terpsiphonei* *Ptilonyssus colluricinclae*
Pachycephala rufiventris (Latham)	Rufous whistler	*Ruandanyssus terpsiphonci* *Ptilonyssus motacillae*
Pachycephala griseiceps Gray	Grey whistler	*Ruandanyssus terpsiphonei* *Ptilonyssus colluricinclae*
	Falcunculidae	
Psophodes olivaceus (Latham)	Eastern whipbird	*Ptilonyssus psophodae*
Falcunculus frontatus (Latham)	Eastern shrike-tit	
Oreoica gutturalis (Vigors and Horsfield)	Crested bellbird	*Sternostoma cuculorum*
	Turdidae	
Turdus merula Linnaeus	Blackbird	Sternostoma technaui
Turdus philomelos Brehm	Song-thrush	Sternostoma technaui
Oreocincla lunulata (Latham)	Australian ground-thrush	*Sternostoma dureni* *Sternostoma technaui*
Epthianura tricolor Gould	Crimson chat	
	Cracticidae	
Gymnorhina tibicen (Latham)	Black-backed magpie	*Ptilonyssus cractici* *Sternostoma thienponti*
Cracticus nigrogularis (Gould)	Pied butcher-bird	*Ptilonyssus cractici* *Sternostoma thienponti*
Cracticus torquatus (Latham)	Grey butcher-bird	*Ptilonyssus cractici*
Cracticus quoyi (Lesson and Garnot)	Black butcher-bird	*Sternostoma thienponti*
Cracticus mentalis Salvadori and d'Albertis	Black-backed butcher-bird	*Ptilonyssus cractici*
Strepera graculina (Shaw)	Pied currawong	*Ptilonyssus cractici*
	Sittidae	
Neositta chrysoptera (Latham)	Orange-winged sittella	
Neositta leucocephala (Gould)	White-headed sittella	
Neositta striata (Gould)	Striated sittella	*Sternostoma neosittae*

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

	Certhiidae	
Climacteris picumnus Temminck	Brown tree-creeper	*Ptilonyssus sittae*
Climacteris melanota Gould	Black tree-creeper	
Climacteris leucophaea (Latham)	White-throated tree-creeper	
	Zosteropidae	
Zosterops lateralis (Latham)	Grey-backed silvereye	*Ptilonyssus ruandae* *Sternostoma cuculorum* *Boydaia zosteropis*
	Dicaeidae	
Dicaeum hirundinaceum (Shaw)	Mistletoe-bird	*Ptilonyssus dicaei*
Pardalotus ornatus (Gmelin)	Red-tipped pardalote	
Pardalotus punctatus (Shaw)	Spotted pardalote	
Pardalotus rubricatus Gould	Red-browed pardalote	
Pardalotus melanocephalus Gould	Black-headed pardalote	
	Nectariniidae	
Cyrtostomus frenatus (Müller)	Yellow-breasted sunbird	*Ptilonyssus cinnyris* Sternostoma tracheacolum
	Meliphagidae	
Melithreptus albogularis Gould	White-throated honeyeater	*Ptilonyssus meliphagae*
Plectorhyncha lanceolata Gould	Striped honeyeater	*Ptilonyssus philemoni*
Myzomela sanguinolenta (Latham)	Scarlet honeyeater	*Ptilonyssus myzomelae* *Ptilonyssus lymozemae* *Boydaia myzomelae*
Myzomela pectoralis Gould	Banded honeyeater	*Ptilonyssus gliciphilae* *Boydaia spatulata*
Myzomela obscura Gould	Dusky honeyeater	*Ptilonyssus myzomelae*
Acanthorhynchus tenuirostris (Latham)	Eastern spinebill	
Gliciphila fasciata Gould	White-breasted honeyeater	
Gliciphila indistincta (Vigors and Horsfield)	Brown honeyeater	*Ptilonyssus gliciphilae* *Sternostoma gliciphilae*
Conopophila albogularis (Gould)	Rufous-banded honeyeater	
Meliphaga fusca Gould	Fuscous honeyeater	
Meliphaga lewinii Swainson	Lewin honeyeater	*Ptilonyssus thymanzae*
Meliphaga notata (Gould)	Lesser Lewin honeyeater	*Ptilonyssus philemoni* *Ptilonyssus thymanzae*
Meliphaga gracilis (Gould)	Graceful honeyeater	*Ptilonyssus philemoni*
Meliphaga chrysops (Latham)	Yellow-faced honeyeater	*Ptilonyssus thymanzae* *Ptilonyssus meliphagae*
Meliphaga macleayana (Ramsay)	Macleay honeyeater	*Ptilonyssus balimoensis*
Meliphaga penicillata Gould	White-plumed honeyeater	*Ptilonyssus thymanzae*
Meliphaga flava (Gould)	Yellow honeyeater	*Ptilonyssus stomioperae*
Stomiopera unicolor (Gould)	White-gaped honeyeater	*Ptilonyssus stomioperae*
Myzantha melanocephala (Latham)	Noisy miner	*Ptilonyssus myzanthae* *Ptilonyssus thymanzae*
Myzantha flavigula (Gould)	Yellow-throated miner	*Ptilonyssus myzanthae* *Ptilonyssus thymanzae*
Anthochaera chrysoptera (Latham)	Little wattle-bird	*Ptilonyssus myzanthae* *Ptilonyssus thymanzae*
Acanthagenys rufogularis Gould	Spiny-cheeked honeyeater	*Ptilonyssus thymanzae*
Entomyzon cyanotis (Latham)	Blue-faced honeyeater	*Ptilonyssus philemoni*
Philemon corniculatus (Latham)	Noisy friar-bird	*Ptilonyssus philemoni* *Boydaia spatulata*
Philemon citreogularis (Gould)	Little friar-bird	*Ptilonyssus philemoni* *Boydaia spatulata*
	Motacillidae	
Anthus australis Vieillot	Australian pipit	*Ptilonyssus motacillae*
Motacilla flava Linnaeus*	Yellow wagtail	Ptilonyssus motacillae Boydaia crassipes
	Alaudidae	
Mirafra javanica Horsfield	Horsfield bushlark	*Ptilonyssus capitatus*

TABLE 4—*Continued*

List of Australian birds examined and their recorded nasal mite parasites—Continued

	Fringillidae	
Chloris chloris (Linnaeus)	Greenfinch	Ptilonyssus carduelis
Carduelis carduelis (Linnaeus)	Goldfinch	Ptilonyssus pygmaeus
		Ptilonyssus motacillae
		Sternostoma tracheacolum
		Boydaia crassipes
Passer montanus (Linnaeus)	Tree-sparrow	Ptilonyssus nudus
Passer domesticus (Linnaeus)	House-sparrow	*Ptilonyssus hirsti*
		Ptilonyssus nudus
		Sternostoma tracheacolum
		Sternostoma cryptorhynchum
		Boydaia crassipes
Serinus canaria (Linnaeus)*	Canary	Sternostoma tracheacolum
	Ploceidae	
Taeniopygia castanotis (Gould)	Zebra finch	*Ptilonyssus motacillae*
Steganopleura bichenovii (Vigors and Horsfield)	Banded finch	
Donacola castaneothorax (Gould)	Chestnut-breasted finch	
Aidemosyne modesta (Gould)	Plum-headed finch	
Aegintha temporalis (Latham)	Red-browed firetail	
Bathilda ruficauda (Gould)	Star finch	
Neochmia phaeton (Hombron and Jacquinot)	Crimson finch	*Ptilonyssus neochmiae*
Poephila atropygialis Diggles	Black-tailed finch	
Poephila personata Gould	Masked finch	
Poephila gouldiae (Gould)	Gouldian finch	Ptilonyssus emberizae
		Sternostoma tracheacolum
Lonchura punctulata (Linnaeus)*	Spice finch	*Ptilonyssus motacillae*
Padda oryzivora (Linnaeus)*	Java sparrow	Sternostoma paddae
	Sturnidae	
Sturnus vulgaris Linnaeus	Starling	Ptilonyssus elbeli
		Boydaia sturni
Acridotheres tristis (Linnaeus)	Common myna	Ptilonyssus elbeli
		Ptilonyssus motacillae
		Boydaia sturni
Aplonis metallica (Temminck)	Australian shining starling	*Ptilonyssus sturnopastoris*
	Oriolidae	
Oriolus sagittatus (Latham)	Olive-backed oriole	*Ptilonyssus trouessarti*
Oriolus flavocinctus (King)	Yellow oriole	*Ptilonyssus trouessarti*
Sphecotheres vieillotii Vigors and Horsfield	Southern figbird	*Ptilonyssus sphecotheris*
Sphecotheres flaviventris Gould	Yellow figbird	*Ptilonyssus sphecotheris*
	Dicruridae	
Chibia bracteata (Gould)	Spangled drongo	*Ptilonyssus dicruri*
		Sternostoma thienponti
	Paradiseidae	
Ptiloris paradiseus Swainson	Paradise rifle-bird	
Ptiloris victoriae Gould	Victoria rifle-bird	
Ptiloris magnificus (Vieillot)	Magnificent rifle-bird	Ptilonyssus novaeguineae
	Ptilonorhynchidae	
Ptilonorhynchus violaceus (Vieillot)	Satin bower-bird	
Ailuroedus crassirostris (Paykull)	Green catbird	*Ptilonyssus ailuroedi*
Ailuroedus melanotus (Gray)	Spotted catbird	
Chlamydera maculata (Gould)	Spotted bower-bird	
Chlamydera nuchalis (Jardine and Selby)	Great bower-bird	*Ptilonyssus sphecotheris*
Sericulus chrysocephalus (Lewin)	Regent bower-bird	
	Corvidae	
Corvus coronoides Vigors and Horsfield	Australian raven	
Corvus cecilae Mathews	Australian crow	
Struthidea cinerea Gould	Apostle-bird	*Ruandanyssus terpsiphonei*
		Ptilonyssus struthideae
Corcorax melanorhamphus (Vieillot)	White-winged chough	*Ptilonyssus corcoracis*

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ADDENDA

Recent visits to Kowanyama have necessitated the following changes to the list of birds recorded there by Standfast (1965) and Domrow (1967*a*). Delete *Dupetor flavicollis* and *Ptilonorhynchus violaceus* as misidentifications of *Nycticorax caledonicus* (juvenile) and *Eudynamys orientalis*, respectively. Add *Tringa nebularia* (D), *Gallinago hardwickii* (W), *Hamirostra melanosterna* (D), *Acrocephalus australis* (W), and *Anthus australis* (D). *Alectura lathami* and *Porphyrio melanotus* are confirmed as occurring in the area, where 139 species of birds are now known.

Two recent papers by Sakakibara should be noted (1968, *J. med. Ent.*, 5: 298–309; 1968, *Acarologia*, 10: 426–431). His description of the exact nature of the dorsal shields of *Ptilonyssus novaeguineae* (Hirst), which is keyed out above on the assumption that it possesses only the podonotal and pygidial shields typical of the vast majority of species, allows its more exact placement in couplet 12, which includes *P. triscutatus* (Vitzthum) and *P. sittae* Fain. It is immediately separable by the shape and proportions of its three dorsal shields and the nature of the leg setation.

I would place *P. paradisaeus* Sakakibara as a synonym of *P. novaeguineae*—the minor setational differences alleged are essentially in characters prone to considerable variation in this group, and both are from paradiseids (Sakakibara lists grackles, Icteridae, among the hosts, but this neotropical family does not occur in New Guinea—this recalls Womersley and Audy's caution (1957, *Stud. Inst. med. Res. F.M.S.*, 28: 231–296) on the tendency for the laconic "rat" and "mouse" on field labels later to be interpreted as "*Rattus*" and "*Mus*".

Likewise, I would place *P. trouessarti pseudotrouessarti* Sakakibara as a synonym of *P. trouessarti* (Hirst). Sakakibara also recognizes *P. orioli* Fain, but his illustration of a paratype is at variance with Fain's, and until the holotypes are compared, I maintain *P. orioli* under the synonymy of *P. trouessarti*. Oriolids figure largely among the hosts of these taxa.

Two other species discussed above (*P. terpsiphonei* Fain and *P. estrildicola* Fain) are also recorded from New Guinea.

P. missimensis Sakakibara is the form of *P. philemoni* Domrow described and figured above from *Meliphaga* spp., and is accordingly synonymized under that species.—March 5, 1969.

Messrs. E. T. Bulfin, A. L. Dyce, H. A. S., and R. D. collected these novelties (not entered in Tables) at Kowanyama in April 1969:

Rhinonyssus coniventris, 4♀♀, 1♂, *Erolia ruficollis* (the variety described with ♂ differing from ♀ only in primary sexual characters).

Rhinoecius cooremani, 3♀♀, *Ninox connivens* (deep in nares).*

Ptilonyssus neochmiae, 1♀, *Neochmia albiventer* Mathews.*†‡

Ptilonyssus echinatus, 1♀, *Hylochelidon ariel* (pygidial shields small, well separated).*‡

Neoboydaia psittaculae, 1♀, *Aprosmictus erythropterus* (differs from Fain's chaetotaxy in showing femora 4.3.2.3; specimen from *Trichoglossus* shows femora 4/3.2.2.2 and tibiae 5.3.2.3; specimen from *Psitteuteles* shows tibiae 4.2.2.2).*

G. et sp. indet. (Speleognathinae), 1 ♀, *Turnix velox* (Gould).*†‡

Mycteroptes basilewskyi, 4♀♀, *Eurystomus orientalis* (* represents new host record, † bird new to Table 4, and ‡ bird new to Kowanyama).

Additional species clearly sighted by R. D. at Kowanyama are *Numenius phaeopus*, *Erolia ferruginea*, *Ardea sumatrana* Raffles, *Dupetor flavicollis* (Latham), *Tyto alba*, and *Artamus minor*, making a total of 148.

Finally, *Sternostoma tracheacolum* caused respiratory symptoms in aviary-bred *Serinus canaria*, Burnie, Tas., iv. 1969, R. W. Mason and A. Little.

Sternostoma borceanum Feider and Mironescu, 1968, *Anal. stiint. Univ. Al. I. Cuza*, 14: 105, from various European turdids, is an obvious synonym of *S. technaui*.—May 27, 1969.

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